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A.R.E.A. Convention Proceedings Number

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MARCH 22, 1947

Editorial Contents, page 51

Railway Age

Founded in 1856

THE PROOF IS IN THE RUNNING

For 13 years General Motors Diesel locomotives have been rolling up some of the most remarkable records that railroad men have ever seen.

Over 150 GM Diesel units have covered more than a million miles each. Many have doubled, and some have tripled this mark. One of the first GM streamliners has topped 3½ million miles—a performance unmatched by any other form of land transportation.

General Motors Diesel units in passenger service—530 as of February 28, 1947 — had an accumulated mileage total of over 350 million miles.

In freight hauling, the record is no less impressive. A total of 1,367 GM Diesel freight units, with an average of 27 months in service per unit, have operated more than 325 million miles.

On a nation-wide basis, all General Motors Diesels—passenger, switcher and freight—show an average availability score of 92 per cent.

The over-all result has been the establishment of a level of operating standards deemed impossible only a few years ago. To the public, it means faster, more reliable service. To the railroads, it means maximum savings and increased earnings.

GENERAL MOTORS LOCOMOTIVES

ELECTRO-MOTIVE DIVISION

GENERAL MOTORS LA GRANGE, ILL.

AN IMPORTANT MESSAGE TO RAILROAD PURCHASING EXECUTIVES

IF WE ARE TO PRODUCE WHEELS FOR 10,000 NEW CARS PER MONTH

You MUST SEND IN YOUR SCRAP!

The Chilled Car Wheel Industry has the plant capacity to produce the wheels for the proposed car building program. This means nothing, however, unless sufficient MELTING STOCK can be obtained. Pig iron can be used to some extent if available but SCRAP WHEELS returned to the industry by the railroads must make up the bulk of the melting stock mixture. If your railroad is selling excess scrap chilled wheels to other than chilled wheel manufacturers, you are jeopardizing the production of new wheels for these vitally needed cars.

The members of the Association of Manufacturers of Chilled Car Wheels will not produce wheels except to the high standards of quality which they have developed. *Therefore:*

Make sure that every scrap wheel from dismantled cars or any other source goes to a chilled wheel manufacturer.

Maintain overshipments of scrap wheels to your supplier of new wheels for repairs in an amount equal to one month's usage of these new wheels. The wheel manufacturer must have this tonnage as a working stock for wheels in process of manufacture and shipment.

If sufficient wheels are to be produced for 10,000 new cars a month, there will have to be mutual cooperation between railroads and wheel manufacturers regarding the scrap wheels to be used in making the new wheels.

AMCCW

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS
445 NORTH SACRAMENTO BOULEVARD, CHICAGO 12, ILL.

American Car & Foundry Co. • Canadian Car & Foundry Co. • Griffin Wheel Co.
Marshall Car Wheel & Foundry Co. • Maryland Car Wheel Co. • New York Car Wheel Co.
Pullman-Standard Car Mfg. Co. • Southern Wheel (American Brake Shoe Co.)

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In This Issue

Page

Many Problems Studied by Engineering Officers During Busy Session at Chicago 602

Much constructive work in the interest of an improved fixed plant was accomplished at the forty-sixth annual meeting of the American Railway Engineering Association.

N. R. A. A. Products Exhibit at Chicago Was Largest in Last 20 Years 620

Latest developments in equipment and materials applicable for use in the construction and maintenance of railway properties were displayed at Coliseum by 101 companies.

EDITORIALS

Education by Advertising in the Elements of Transportation Economics 589
George P. McNear 590
Staying on the Job 590
For "Brass Hats" Only? 591

GENERAL ARTICLES

Lighter and More Durable Freight Cars, by A. T. Cox 592
Loud Speakers on Rio Grande 594
Background of T. P. & W. Strike 596
One Road Microfilms 25 Million Records, by D. K. Taylor 598

CONVENTION SECTION

Many Problems Studied by Engineering Officers During Busy Session at Chicago 602
N. R. A. A. Products Exhibit at Chicago Was Largest in Last 20 Years 620

GENERAL NEWS 624

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RAILWAY AGE

Education by Advertising in the Elements of Transportation Economics

The primary domestic political and economic objective of the American people is, or should be, to assure the health and progress of our system of free private enterprise. There would be no point in establishing in Greece or somewhere else abroad a frontier against the further advance of totalitarian socialism, as President Truman has advocated, if, in the meantime, essential industries here at home are to become so impoverished that they can no longer be financed by private investment and have to be socialized in order to continue operation.

The railroad industry does not have the problem of convincing a substantial majority of the public that private ownership and operation of railroads is desirable in the public interest—that opinion is already predominant. The problem is, rather, to secure public understanding and support of the *means* necessary for the retention of private capitalism in transportation. If an industry is to continue to provide satisfactory public service in private ownership, it must have readily available at all times a supply of private investment funds, required for plant improvements to keep the industry up-to-date. The best test of an industry's ability to obtain ample new capital on reasonable terms is the price at which its securities—especially its stocks—are selling.

How Investors Appraise the Risks

Generally speaking, if common stocks are bringing a price substantially above par, the industry has no difficulty in obtaining ample new capital. It may not *actually* secure the funds it needs by selling stock; instead the management may conclude that the money may be obtained more advantageously by the reinvestment of earnings or even by the issue of bonds—but the important point is that the avenue of a stock issue should be open. If it is not, then the industry is not a thriving private enterprise. Investors are not putting funds into it eagerly or even willingly, but require added inducement in the way of preferential treatment. No industry which finds such difficulty in raising new funds can possibly keep its services as modern as one which has ready investment capital at its command. Under such circumstances, it can make only the more necessary improvements, and omits or postpones the remainder.

The stocks of the railroads have not sold at an average price of 100 or more on the Dow-Jones index since early in 1931—which is another way of saying that, since that time, the railroad industry as a whole has not had, in the eyes of the investor, the reputation of a sound and thriving business. Investors will *lend* money to the industry—or to most of it—if they are given a preferential claim on principal and earnings, but they apparently do not believe, and have not believed for 16 years, that the industry as a whole promises to earn enough on its entire plant to make it an attractive venture.

Dividends Have Been Inadequate

Preponderant public opinion wants two things from the railroads, viz., (1) progressively improving service and (2) that the industry remain in private ownership. These two desires can be satisfied, in the long run, only if the railroads enjoy a volume of traffic and are allowed a level of rates which will yield net earnings sufficient to pay dividends, current and prospective, attractive enough to cause railroad stocks to sell consistently at a price in excess of par. President R. V. Fletcher of the Association of American Railroads in a public statement (see *Railway Age*, February 22, page 408) called attention to the fact that the railroad industry in 1946—a year of record peace-time traffic—earned a return of only 2¾ per cent on investment less depreciation. He predicted furthermore that, even with the freight rate increases which went into effect on January 1 this year, the railroads in 1947 are not likely to earn more than 3 per cent on their investment less depreciation. Average dividends on railway stocks have been as follows:

	Avg. Dividend Rate, All Stock %	% of Stock Paying No Dividends
Five years ended 1925	4.39	37.99
Five years ended 1930	5.60	26.76
Five years ended 1935	2.25	58.84
Five years ended 1940	2.02	64.23
Five years ended 1945	2.85	45.88

Such earnings and dividends in the period since 1930, and in prospect for the immediate future—combined with the warning to investors in the millions of railway stocks which have been wiped out in reorganization proceedings—have their reflection in the current average price of railroad stocks, i. e., less than 50, as compared to more than 170 for the stocks of unregulated industry. In January, 1947, the railroads earned only $58 million of net railway operating income, or scarcely more than they earned in January, 1930, when their freight traffic was one-third less than in January of this year.

With such conditions in the railroad industry, the newspaper advertising campaign that the regional railroad associations have recently inaugurated to focus attention on these matters is both timely and imperatively necessary—not alone in the interest of the railroads, but in that of the public as well. The railroads need about double the net earnings they are now showing if they are to manifest the vigor as private enterprise which is desirable in the nation's interest. They need such earnings to assure the continuance of satisfactory service, for the defense of private enterprise, and for opposition to socialization and totalitarianism on the home front.

Their joint advertising will, it seems reasonable to suppose, point out not only the railroads' need for additional net earnings, but also *how* such earnings may be attained, e. g., not only by the authorization of an adequate level of rates, but also by the exercise of some restraint in the bestowal of political favors and appropriations upon pressure groups inimical to the railroads.

The Fundamental Issue

In the meantime, individual railroads are not leaving the vital and necessary task of public education in these matters solely to the various railroad organizations. For example, the Louisville & Nashville in recent newspaper advertising has elucidated this theme, not from the standpoint of the interest of that property alone, but, instead, in that of the public interest in a vigorous railroad industry, amply financed from private sources. Other railroads have also contributed by their advertising and publicity to better public understanding of this issue, or are planning to do so. Outstanding among these has been the Boston & Maine with its courageous discussion in advertising of the question of public subsidies for air transportation. There should be more of such endeavor by individual companies, and doubtless will be. As President W. G. Vollmer of the Texas & Pacific said in an address at Chicago a month ago: "The time has come when we must tell our story, and tell it effectively and persistently, if our industries are to survive."

It is only incidentally a question of a "square deal" for the railroads; the big issue is, rather, the prevention of a victory for totalitarian socialism here at home at the very time when hundreds of millions are proposed to be spent to prevent its extension to foreign countries. It is not an appeal to the sympathy or even to the chivalry of the public, but, primarily, to their self-interest in adequate transportation service and in the preservation of American institutions of economic and political freedom.

George P. McNear

Even primitive savages can usually be depended upon to deal tolerantly with those who observe all their tabus. The real test of the state of civilization of a community lies in the treatment it accords to those who do not conform to predominant standards of behavior. The late George P. McNear had for the Toledo, Peoria & Western an owner's point of view which has grown unusual and is regarded by many as old-fashioned. He was inflexible in his determination not to yield the prerogatives which used to be traditionally associated with ownership, and not to pay for work not performed nor for employees whose services he did not need. While his assassins have not been apprehended, it seems a reasonable supposition that they must have been enemies he made directly or indirectly through his assertion of and insistence upon his rights as a property owner—rights which nowadays most owners of property have preferred to compromise, rather than hazard an untimely end.

So let those who would maintain that Mr. McNear was a hard man to deal with, or that his ideas of employer-employee relationships were outmoded, reflect upon the degree of social progress manifested by the manner of his death. Mr. McNear, at least, did his fighting through the courts—the recognized agencies for the peaceful settlement of disputes; and employed armed guardians for his property only to substitute for the police protection which was either lacking or inadequate. But his assailants fell back on the behavior of Cain—or of the modern dictators—as precedents for their conduct.

Thus, if it be contended that Mr. McNear's ideas of social relations were those of the mid-nineteenth century, then what date in the progress chart of social relationships should be put upon the means by which he was silenced? Unless the murderers are speedily apprehended and dealt with as the law prescribes, Mr. McNear must go down in history, not as a man whose views of social behavior lagged behind those of his community (as some may contend), but, rather, as one who, by his acceptance of legal restraints, proved to be far more civilized than his environment.

Staying on the Job

Many laymen and too many railroad men, when making comparisons, think of the steam locomotive in terms of performance which was out-of-date years ago. They may be aware of improvements in steam locomotive design but are apparently uninformed of progress in keeping the steam motive-power unit on the road doing useful work.

A steam passenger locomotive arrived on a recent morning at a terminal at which it was scheduled to receive regular quarterly inspection starting the following morning. Two courses of action were possible —the locomotive could be held at the terminal for the inspection or it could be dispatched on a run, turned at a distant terminal during the night and returned the next morning to the inspection point after making approximately 800 miles. It was decided to send the locomotive out on the run. There was no fuss at

the enginehouse over assigning the locomotive to the run. There was no doubt in the minds of the men responsible for sending the locomotive out that it would be back the next morning on schedule. That particular locomotive had averaged more than 25,000 revenue-producing miles a month during the preceding six months and 800 miles more were just a matter of routine.

To make 25,000 miles a month—an average of 833 miles for every day in a 30-day month—a locomotive cannot spend much time loafing around an enginehouse. That kind of mileage means that the locomotive has to average better than 50 miles per hour 16 hours a day, which is a pretty good performance for any locomotive; and it certainly could be considered a top-notch job for what some people apparently consider an obsolete piece of equipment.

Here was another demonstration that the well-designed steam locomotive, properly handled, is a dependable machine which, under similar conditions of assignment, can turn in a mileage performance which compares favorably with any accomplished by other types of motive power. This kind of locomotive operation also shows what intelligent planning, and a revision in the belief that a steam locomotive has to spend a large portion of the time being serviced and repaired, can do in improving the usefulness of a machine the capacity of which for staying on the job has been greatly underestimated.

For "Brass Hats" Only?

The American Railway Engineering Association has completed another highly constructive year. Those who take time to review the activities of its annual convention in Chicago, March 18-20, as reported in this issue, will unquestionably be impressed with the breadth and scope of the subjects considered, embracing as they do practically every phase of railway construction and maintenance. They may well be impressed, too, with the highly scientific aspects of most of the studies and investigations undertaken, and the diligence and tenacity with which the various committees and other groups have pursued these studies year after year, often with what has appeared to be slow progress in any one year. Few associations, either within or outside the railway industry, can lay claim to a more impressive record of achievement.

Continuing outstanding progress is assured for the association under its present forward-looking leadership and policies, and especially the policy which constantly welcomes new blood into its ranks, including the more alert, qualified younger engineers in the field, and even engineers of junior grade, under the "junior membership" arrangement initiated several years ago. That this policy is sound is beyond question; it is reflected in much of the more creditable work that is being done by the association today.

But notwithstanding this policy, and not overlooking the many talented younger men who are already members, a check of the membership as a whole, of committee personnel, and of those who registered their attendance at the recent annual meeting, indicates clearly that the association has not been as successful as it might be in winning to itself the maximum available talent in the field, especially among younger men, some of whom have had their experience deeply enriched by military service. For this, any one of several factors may share responsibility, the established policies of the association to the contrary.

For example, some younger engineers, it is known, view the A. R. E. A. as a "chief engineers'" organization, in which younger, less experienced engineers can expect anything but a whole-hearted welcome. Others, it appears, know they are eligible and welcome as members but expect that for many years they must assume the roll of spectators—that it is only the viewpoints of the "chief engineers" that prevail, and that the younger voice is out of place in important association deliberations. More serious than any such belief, which is known to be contrary to association policy, is the situation of the younger member whose requests to attend annual meetings or periodic committee meetings are turned down repeatedly by his "chief engineer"—who feels it more important that the "brass" in the engineering and maintenance department attend.

The A. R. E. A. never would have been what it has been over the years, and is today, if it were not for the "brass" of which some younger engineers are prone to speak so lightly. At the same time, since the association can also benefit from the experience of the "less-than-brass" among the engineering and maintenance forces, should it not go to such lengths as may be necessary to correct any suspicion that its welcome to qualified younger engineers is anything but sincere? If a genuine welcome to younger engineers is adequately disseminated by the association, this already strong and productive organization is certain to grow even stronger and more productive.

Hoosier Statesmen See the Light

The following resolution has passed both houses of the Indiana legislature:

"Indiana needs no guardian and intends to have none. We Hoosiers—like the people of our sister states—were fooled for quite a spell with the magician's trick that a dollar taxed out of our pockets and sent to Washington will be bigger when it comes back to us. We have taken a good look at said dollar. We find that it lost weight in its journey to Washington and back. The political brokerage of the bureaucrats has been deducted. We have decided that there is no such thing as 'federal' aid. We know that there is no wealth to tax that is not already within the boundaries of the 48 states.

"So we propose henceforth to tax ourselves and take care of ourselves. We are fed up with subsidies, doles and paternalism. We are no one's stepchild. We have grown up. We serve notice that we will resist Washington, D. C., adopting us.

"Be it resolved . . . That we respectfully petition and urge Indiana's Congressmen and Senators to vote to fetch our county court house and city halls back from Pennsylvania Avenue. We want government to come home. Resolved, further, that we call upon the legislatures of our sister states. . .to join with us."

Lighter and More Durable Freight Cars

Advantages of combining high-strength steels and welded construction are emphasized by recent freight-car designs

By A. T. COX
Vice-President, Engineering
The Lincoln Electric Railway Sales Company

LOW-ALLOY high-strength steels and arc welding have been teamed up to provide American railroads with cars which will carry more payload and, at the same time, cars which cost less to build and maintain. This double-barreled saving comes from the lighter weight of the cars because of a reduction in thickness of sections made from the stronger steel, and the simplified design and construction of the cars built by the arc-welded process.

A modern hopper car weighing 33,500 lb., a saving of 6,540 lb. over the standard A. A. R. hopper cars made of carbon steel, attracted attention and comment last summer when it was displayed in several parts of the country. The deadweight saving was translated into three and one-quarter tons additional payload. In another case, the Erie cut over four tons off the tail of some of its trains when it built and put 100 caboose cars into service. Their welded construction reduced the weight per car by 8,900 lb.

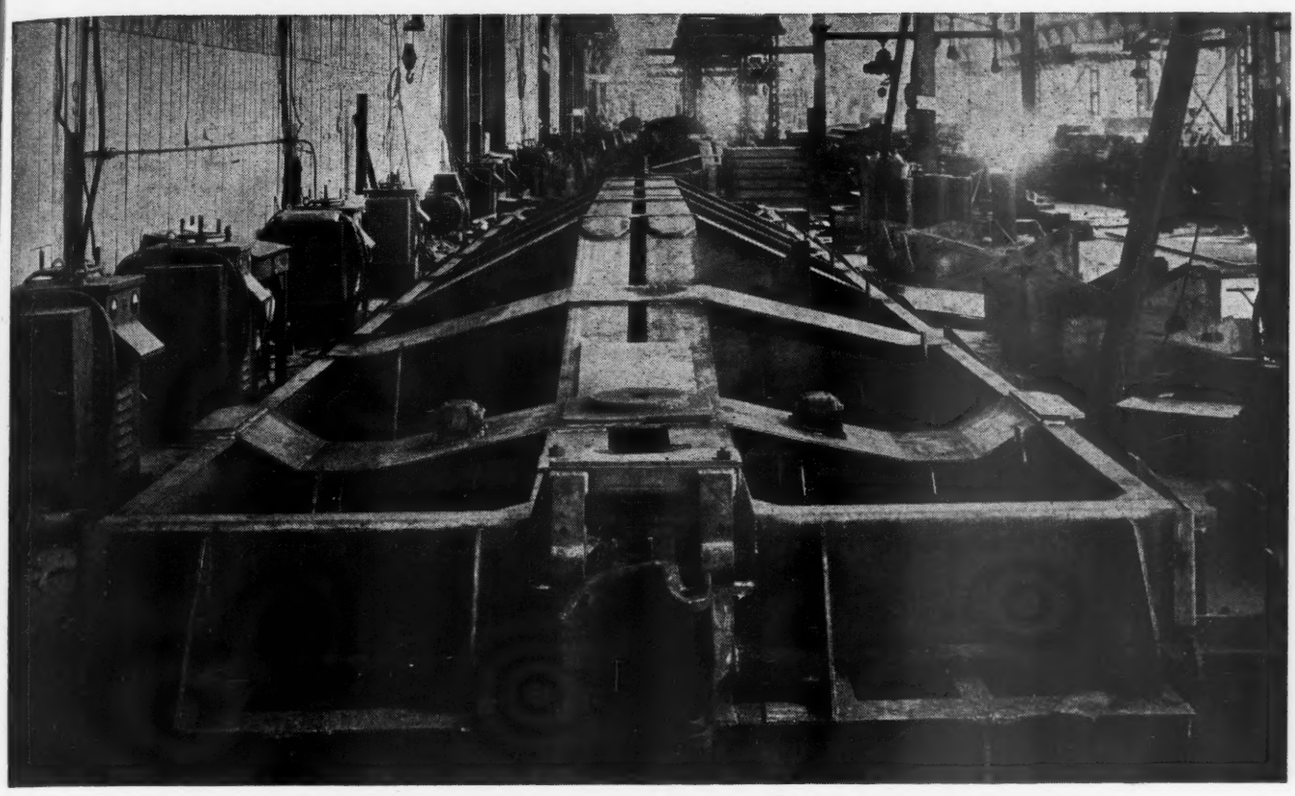
Arc-welded construction permits the use of new types of joints which simplify construction, provide tighter seals against moisture and eliminate laps inherent with riveting. On the hopper-car construction, for example, hot pressing and elaborate die work were avoided by the Carnegie-Illinois Steel Corporation, the builder. Standard sections and plates with straight trim and simple cold bends are a basic concept of the new welded design. On somewhat the same principle as ship building was speeded by welding during the war, the car structure can be designed for sub-assemblies, such as underframe, sides and ends, which flow into assembly of a complete car.

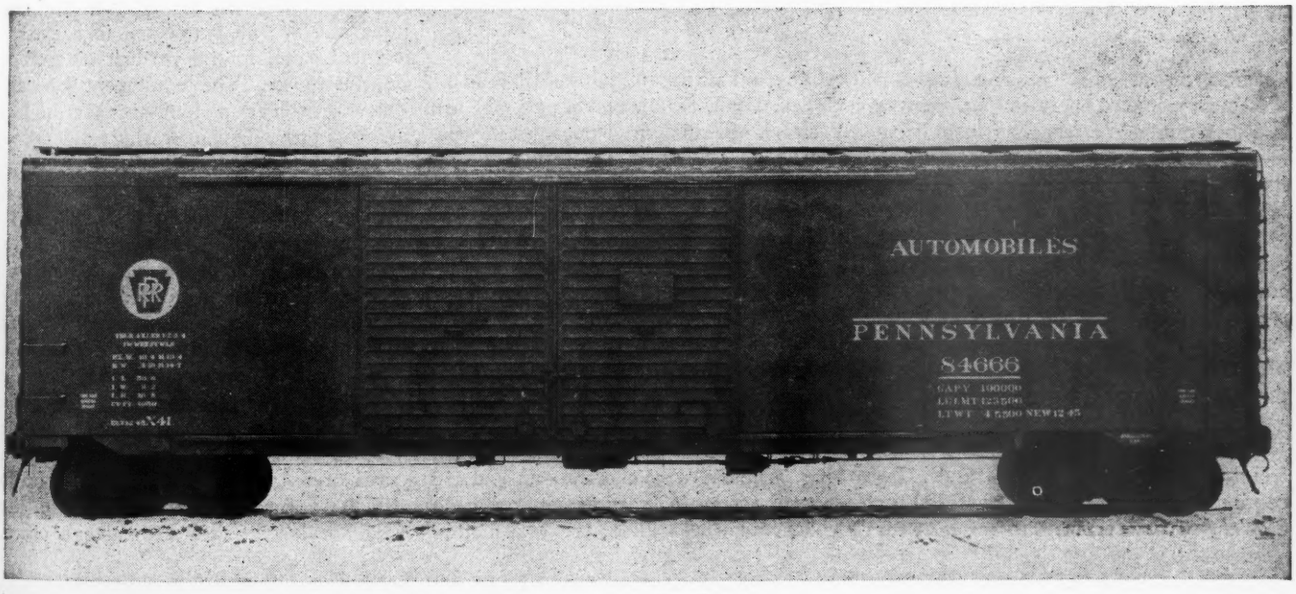
An example of modern car assembly methods may be found in the flat cars built for the Great Northern by the American Car & Foundry Co., Berwick, Pa. A large fitting fixture is used in building all-welded underframes for flat cars. Parts are assembled in the fixture. Work is started upside down in order to keep a flat surface on top of the car and so welding which normally would be done in an overhead position may be done in the down position. This permits the use of larger-size electrodes and thus faster and more economical construction. The assembly may be turned on its side or completely over for other operations. The underframe is removed from the jig for the welding of certain other members under the most favorable conditions.

The underframe construction methods described are typical of the positioning arrangements used on other assemblies. The Great Northern also built 1,000 50-ton box cars in its shops at Superior, Wis., and St. Cloud, Minn., of low-alloy, high-strength steel and arc welded construction. The Pennsylvania has completed in its Altoona, Pa., shops 500 automobile box cars of similar construction, and each saved nearly five tons of dead weight over similar cars of carbon steel. In many cases, such as the 50-ton hopper car built by Carnegie-Illinois, the welding was manual. However, the design was for the use of the latest automatic welding processes and, when automatic welding is applied, greater construction economies will follow.

The ability of these alloy-steel cars to resist corrosion and their rugged, permanent welded construction are factors which add to their life and lower their maintenance costs during that longer life. The cars have smooth

Assembling the cupola to the roof of one of the 100 new all-welded Erie cabooses





Above—An underframe for Great Northern flat cars in the welding fixture at the American Car & Foundry Co.'s plant at Berwick, Pa. Below—One of 500 automobile box cars of high-strength steel and welded construction built by the Pennsylvania at its Altoona shops

interior surfaces which allow the free flow of materials in loading and unloading and avoid damage to the structure by loading devices. The smooth interior surface is obtained by welded construction which eliminates protruding structural members or seam ledges. These smooth surfaces also permit easier painting and give better appearance.

It is seen then that welded car design more than eliminates the punching, drilling and riveting operations of previous car-building methods; it also simplifies design and fabrication. However, broader experience which will accompany the growing trend toward the welded construction of railroad cars, both freight and passenger, is expected to bring about design and building economies well beyond those effected so far.

Generally, emphasis has been on the extra payload which comes from the lighter and stronger cars. Obvious as it is, it may not be an advantage which appeals too strongly to a railroad whose modern cars may be earning revenue over some other line. The more direct advantage of more cars for the money is the factor which will accelerate the changeover to lightweight all-welded freight cars with the advantages of more payload accruing fully after a sufficient number of railroads have obtained a quantity of the improved lightweight cars.

Yardmaster at the control panel in the west tower

Loud-Speakers on Rio Grande

Installation in large flat yard at Salt Lake City reduces idle yard crew time and initial terminal time for road trains and expedites the yard's operation by closer supervision

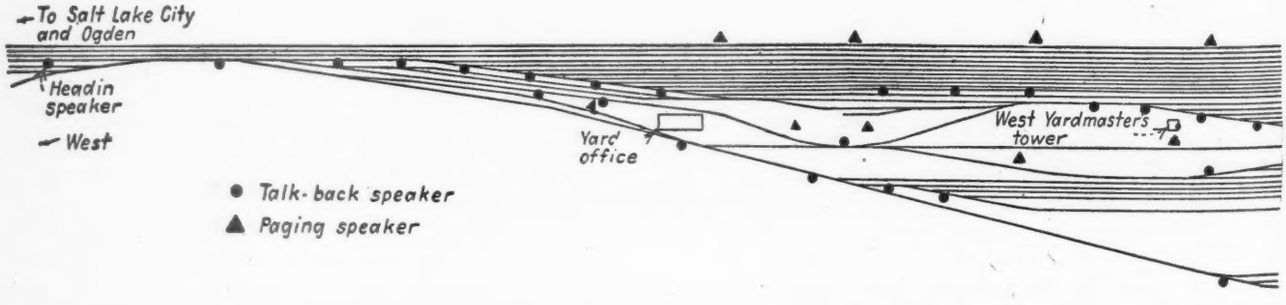
As a means of increasing the efficiency of yard operation, the Denver & Rio Grande Western has installed a loud-speaker communication system in its Roper yard, a large, flat 51-track facility near Salt Lake City, Utah. The system provides two-way communication between yardmasters in elevated towers and yard crews working near talk-back speakers which are located along the leads and at other strategic points. Monitoring loud-speakers are located in the yard office and in the office of the assistant superintendent.

This yard is the principal western freight terminal of the Rio Grande. Incoming westbound cars are classified for delivery to (1) local industries, (2) the Southern Pacific and Union Pacific at Ogden, Utah, 37 mi. north, and (3) the Western Pacific in Roper yard, the westbound W. P. trains being made up here. Eastbound cars are classified for delivery to certain connecting roads such as the Burlington, Rock Island and Union Pacific at Denver, or the Missouri Pacific, Santa Fe and Colorado & Southern at Pueblo. An average of 40 trains, including 2,980 cars, are handled daily through this yard, which is in operation 24 hr. daily, with a total of 33 yard locomotives and crews.

The yard as a whole is about 1.6 mi. long. The operations at the east end are supervised by a yardmaster on each trick, who works under the jurisdiction of an assistant general yardmaster, who also supervises the west end of the yard. Prior to the recent improvements, these men spent most of their time in the yard walking back and forth to locate yard crews or other employees in order to give them instructions. This method was ineffective in securing efficient coordination. The installation of the talk-back lound-speaker communication system has corrected these conditions.

With the new system the yardmaster on each trick has supervision of the east end, and the assistant general yardmaster the west end, the same as before. A difference, however, is that each of these men is now located in an office in a brick tower 12 ft. square and 43 ft. high, located centrally in his area, so he can watch the work, floodlighting being provided for illumination at night. If he wants to issue instructions to any certain crew, he uses the new communication system to converse with them promptly.

The system includes talk-back speakers at 72 locations along the leads, at the switches where trains enter the yard, at the ice docks, the repair track, car foreman's office and other places where men may be working. These speakers are on pipe masts about 6 ft. high. The talk-backs in both the east and west ends of the yard, as indicated on the diagram, are all connected to a special control panel in the yardmaster's office in the tower. The equipment in each tower includes a loud-speaker and a microphone. By operating a corresponding key the yardmaster can connect his office equipment to the circuit extending to any given talk-back location in his area. When he presses his foot-switch and speaks into his microphone, his voice is reproduced by the talk-back, which has a range of about 100 ft. When he releases his foot-switch, the circuit is set up for an incoming reply. A characteristic of a talk-back is that it will serve also as a microphone to pick up a reply from a member of a yard crew, within a range of 50 ft. to 100 ft., and reproduce this reply on the loud-speaker in the yardmaster's office.



Plan of Roper yard showing the locations of the

When the conversation is completed, the yardmaster places the key to the normal position.

When a yardman at a field location wants to start a conversation with the yardmaster, he presses a button on the mast supporting the talk-back device. This action sounds a buzzer in the yardmaster's tower, and lights a white lamp above the corresponding key lever on the control panel, which stays lighted until answered. The yardmaster pulls that key lever to connect his speaker to that circuit and steps on his push-to-talk switch when speaking to acknowledge the call. At the end of the conversation the yardmaster returns the key lever to its normal position.

When an incoming train arrives at the yard entrance switch the head brakeman uses a talk-back speaker to call the yardmaster, who tells him which track the train is to be pulled in on. In the meantime, the yardmaster issues instructions as may be required for yard crews to keep clear of the leads, so the incoming trains can pull in without delay. When coupling a train for departure, the loud-speaker system is used in numerous ways to pass instructions and call certain men quickly to do this or that. When the yardmaster sees that a train is ready to go, he issues instructions to yard crews to clear the leads to let the road train pull out promptly.

When the yardmaster wants to talk to some foreman or other person whose exact whereabouts is not known, he uses a paging speaker to broadcast a call over an extensive area. These are high-powered speakers mounted on 60-ft. poles at intervals of about 500 ft., there being a total of 28 of these speakers in the entire yard. The man called goes to the nearest talk-back to answer. The paging speakers may be used also to issue emergency announcements of a general nature.

Thus the yardmaster in a high tower can see the work under way, and he has a communication system to talk with the yard crews on a moment's notice. As a result he issues instructions which coordinate the work of the various crews, thereby preventing unnecessary delays. Idle time of switch engines and crews has been reduced. Departing trains pull out on schedule, reducing terminal delays.

Pneumatic Tube System

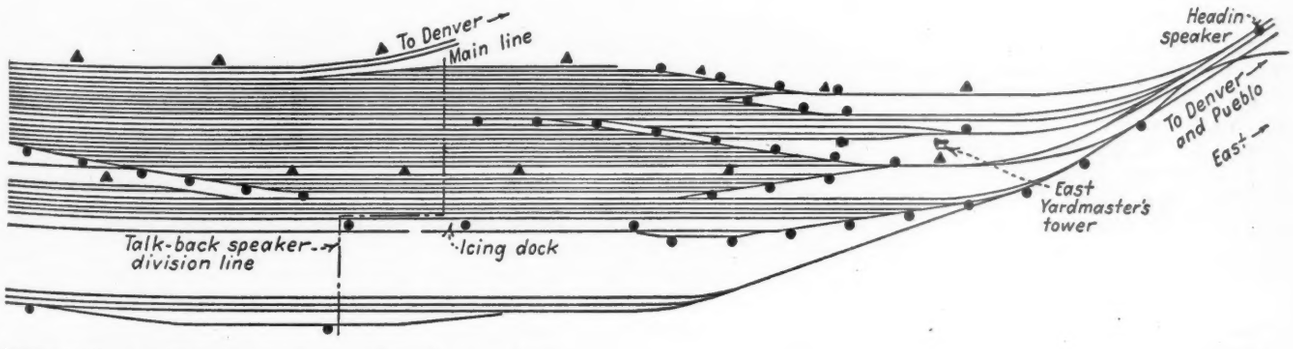
A part of the improvement program was the installation of 4-in. pneumatic tubes to transmit waybills, switch lists and other papers between offices in the yard. One tube extends from the east tower to the yard office and another from the west tower to the yard office. Four minutes are required for a cartridge to travel between the yard office and the east tower, and 53 sec. between the yard office and the west tower. In the towers these tubes terminate in the office of the yardmaster on the top floor. From this office a separate tube extends down to the yard clerk's office on the floor below.

When a train arrives, the conductor delivers the waybills to the yard clerk and he sends them by tube to the yard office. Here the bills are checked and sorted, and switch lists are prepared for transmission by tube to the towers. The yardmasters check the lists, and send them by tube down to the yard clerk who delivers them to the yard conductors, otherwise known as foremen. While the switching is under way, the clerks in the yard office arrange the waybills for each departing train, and the consists are sent by teletype to division points and terminals ahead. Then the bills are sent by tube to the yardmaster's office, and, after being checked, are delivered to the conductor of the departing train.

This installation of communication equipment and pneumatic tubes was made under the direction of W. W. Pulham, superintendent of communications, and R. S. James, assistant superintendent, Salt Lake division, representing the operating department. The engineering was done by J. N. Hopkins, telegraph and telephone engineer. The design and construction of the brick towers was under the direction of O.

Crewman receives instructions from a talk-back speaker

K. Peck, engineer of structures. The talk-backs as well as the paging speakers in the yard were furnished by the Radio Corporation of America. The speakers in the towers and in the yard offices were furnished by the Webster Electric Company. The amplifiers were made by the Electronic Communications Equipment Company. The special control panels in the towers were designed and constructed by the Rio Grande. To eliminate cross-talk, special two-conductor cable was installed from the towers to each speaker location, a total of 130,000 ft. of this cable, furnished by General Electric Company, being used. The pneumatic tube equipment was furnished by the Grover Company. An article concerning this project, published in the March issue of "Railway Signaling," includes more complete details concerning the circuits, power supply and construction.



towers, offices, talk-back speakers and paging speakers

Background of T.P.&W. Strike

THE murder on March 10 of George P. McNear, Jr., president of the Toledo, Peoria & Western, and "stormy petrel" of railroad labor relations during the whole of his 19-year control of the railroad (reviewed in last week's *Railway Age*), brings again to the arena of public interest his long and doughty fight against railroad labor organizations seeking to force the introduction of so-called "standard" working rules on his small, but important, property. The *pros* and *cons* in the long dispute have been made public from time to time by Mr. McNear, by the brotherhoods, and by the federal managers appointed by Presidential order to operate the strike-bound road during the war. The incidents of the strike itself have received considerable publicity. But, as far as is known, neither the working rules originally in effect on the T. P. & W. nor Mr. McNear's more recent new rules schedules—both of which precipitated the strike—have recently been made available publicly for convenient reading.*

A Strategic "Overhead" Line

Lying wholly within Illinois, except for its Mississippi river crossing, the 239-mi. T. P. & W. extends from Effner on the east to Keokuk, Iowa, on the west. Between Peoria and Hollis, about 7 mi., its trains operate over the Chicago, Burlington & Quincy and the Peoria Terminal Company. Although a single superintendent and operating staff are in charge of the road, it is divided, for purposes of train operation, into two divisions:

Eastern—Effner to East Peoria—108 mi.
Western—East Peoria Yard to Keokuk—115.7 mi. (main line).

The Eastern division interchanges with 14 individual railroad lines, and the Western, 22. The road as a whole interchanges carload freight with 19 separate companies. The historic purpose of the railroad has been to provide the Pennsylvania a direct outlet west from Logansport, Ind., and normally, two out of three cars moving on the T. P. & W. are either delivered to, or received from, the P. R. R. at Effner. Two thirds of the total traffic of the road is "overhead," and requires no handling to or from sidings. Further, most of the tonnage originating or terminating on line is received or delivered through the use of reciprocal switching privileges. About 95 per cent of total traffic passes through Peoria yard, where all classification work is concentrated. Interchange points are unusually well-grouped for efficient operation. About 90 per cent of interchange is accomplished at Peoria or at the eastern or western terminals of the road. The east end interchange points comprise a compact group which can be handled as a unit. The west end is more difficult from the standpoint of crew assignments.

The road owns and operates 16 locomotives. Passenger train service was discontinued in 1927. In 1942, average car movement on the T. P. & W. approximated 300 loads and 150 empties daily. A pool of 11 crews operated all scheduled through freight trains. Three additional crews handled local trains. Thus 70 men provided all regular service on the road.

Since "overhead" traffic is the most vulnerable of all, and can be shifted by the shipper to competitive routes readily and at will, the problem of the road has always been to schedule its trains so as to make good connections at both ends of the line. For this reason, and because of its length and volume of traffic, efficient operation of the line demands that the working rules of train and engine service employees provide a high degree of flexibility.

Constituting an "outer belt" line, straddling two rate territories, and furnishing a by-pass line for interchange traffic around Chicago and St. Louis, the T. P. & W. naturally increased in strategic importance during the war, as the larger gateways became overloaded. It was for this reason that a strike which paralyzed the railroad starting December 28, 1941, almost concurrent with the Pearl Harbor attack, became a national crisis which called for special action by President Roosevelt and the appointment by the Office of Defense Transportation of a federal manager to take over the property ending either the settlement of the brotherhoods' dispute with the railroad corporation or the termination of the war emergency.

Except for a contract with the Brotherhood of Locomotive Engineers, the railroad corporation maintained no contract with any of the "standard" railroad unions, but made limited agreements with a number of so-called "company associations." Numbers of transportation employees were members of the standard organizations, but the latter were not recognized by the management in negotiations or the handling of grievances, even though meetings between officers of these unions and the railroad were held from time to time.

On November 13, 1929, in a strike called by a group of "standard" unions (including train service, shop and maintenance of way organizations), 22 per cent of the employees ceased work. The locomotive engineers, the only employees covered by a contract with a "standard" brotherhood, did not join the strike. Marked by considerable violence and court injunctions, the work stoppage lasted until June 25, 1930, when the management agreed to take back certain of the striking employees as conditions warranted, subject to the seniority of the men in active service on the date of settlement. The road did not, however, agree to making contracts with any of the organizations which called the strike and, later, on December 31, 1931, took advantage of a termination clause to cancel even the contract it held with the Brotherhood of Locomotive Engineers. Starting in 1941, elections under the Railway Labor Act certified a number of the standard unions as qualified representatives of classes of employees, but it remained for the federal manager to enter into formal agreements with them regarding wages and working conditions.

Rules in Effect

Prior to federal operation, train and engine service employees of the railroad worked under "non-standard" rules, which differed from those of probably every other Class I line in that, among other things, they provided for no separation of yard and road service. Thus, if crews ran their road trips in less than the 12½ m. p. h. time equivalent of the basic 100 mi., they could be used in yard service up to the time at which overtime would commence, without extra pay therefor. At the same time, the rates of pay for the basic day were less than those prevailing under national agreements.† Until December 29, 1941, the increases granted by other carriers, effective September 1 and December 1, 1941, were not applicable to operating employees on the T. P. & W. Other arrangements differing from "standard" practice were in effect on the road. For example: pusher service up a grade near Washington, Ill., collection and delivery of cars at that point and interchange with a connecting road at Farmdale were usually performed by a locomotive manned either by the road foreman or by a hostler, assisted

* The *Railway Age* of January 10, 1942, page 175, summarized the T. P. & W.'s proposed rules effective December 29, 1941.

† This difference was somewhat lessened by a "bonus" which employees on the payroll for a stated minimum period received on the basis of 365 working days a year, as follows:

1941	14 days' additional pay
1940	4 days' additional pay
1939	10 days' additional pay
1938-1936	7 days' additional pay

by any available roundhouse laborer to act as fireman and brakeman. No additional pay was allowed for this duty. Furthermore, the services did not enter into the road's statistics of man-hours or compensation.

The Strike of 1941

At the same time that the "standard" brotherhoods were demanding that the road enter into agreements with them providing working rules and rates of pay similar to those in effect on other Class I carriers, the T. P. & W. management moved to place in effect a new schedule of wages and working conditions, which, while it increased pay scales about 10 per cent, to some extent widened the gap between rules on the T. P. & W. and other roads.

On December 21, 1941, after the services of the National Mediation Board had been exhausted, the management's request for an "Emergency Fact Finding Board" refused, and arbitration had been refused, in turn, by the corporation, the railroad issued formal notice that a new basis of wages and revised rules of working conditions would be placed in effect December 29. This basis had previously been submitted to the employees, but it had not been negotiated or accepted by them. The Brotherhoods of Railroad Trainmen and of Locomotive Firemen & Enginemen thereupon called a strike to begin December 28. All but a few of the railroad's 109 transportation employees stopped work on that date. The company tried to continue operations with its "loyal" employees, officers and newly-hired men, but, in view of shortage of trained railroad employees available for hire, the stigma of strike-breaking, and continuous interference by striking employees or their sympathizers with the road's operation, the attempt was an almost complete failure.

In view of the importance of the road as an east-west gateway link, the newly-formed War Labor Board assumed jurisdiction over the controversy in February, 1942,—after, be it noted, an "emergency board" survey of the merits of the controversy had been denied to the T. P. & W. two months earlier on the grounds that the road was not essential to interstate commerce. When the railroad continued to refuse to submit the issue to arbitration, the War Department advised President Roosevelt that the interruption to service was detrimental to the successful prosecution of the war. Executive Order No. 9108, issued March 21, 1942, gave the property into the management of the O. D. T. and a federal manager took over on March 22.

Important points in the schedules which the road made effective December 29, 1941, which were the immediate cause of the strike, were as follows:

(1) Miles run in excess of 100 were paid at the rate of one-half of the pro-rata rate instead of pro-rata. Thus, after 100 miles, 25 service-mi. instead of 12½ mi. were the equivalent of one hour's additional compensation.

(2) All restrictions were removed on the mileage or time or type of work which might be performed on a continuous basis.

(3) The basic scale of pay for the first 100 mi., or 8 hr., of service was made slightly higher than any of the "standard" rates.

(4) All differentials in rates of pay applicable to class of train service or weights of locomotives were abolished. Crews could, therefore, be used in all service without the road incurring penalties therefor.

(5) Seniority was reduced in importance as a factor in the distribution of runs, promotions and employment status. The schedule read, in part:

"The management may from time to time designate the employee who is to fill each position or place where such employee is to be used. . . . In selecting the employee . . . the management will give consideration to ability, seniority, loyalty, personal habits, and attentiveness to the best interests of the railroad, and shall not be limited to the men who bid therefor. If, in the judgment of the management, the said considerations other than seniority are substantially equal, the man longest in service shall have preference; however, the decision of the highest operating officer of the railroad shall be final."

(6) The management retained exclusive and final jurisdiction over grievances.

(7) Apprentice rates were established for brakemen and firemen. Thus, whereas full-fledged brakemen received $7 per basic day, apprentices received $4.12, $5.00 and $6.04 per day for their first, second and third groups of 720 hours' employment, respectively. Full pay did not start until 2,160 hours had been worked.

(8) "Duplicate or double payment for any time" was specifically barred, "anything in this schedule to the contrary notwithstanding."

(9) Any employee of the road could be used as a pilot or in handling or switching cars, and, while so used, was not considered a conductor or brakeman, or subject to the schedule.

(10) The yard seniority lists at Peoria (sole point at which switching crews were employed) were discontinued. Crews working at that point were placed on the single rosters covering all crews on the road.

Under the Federal Manager

Since his primary duty was to restore service on the railroad, the federal manager vacated the new schedule, restored the old schedules temporarily, and immediately entered into negotiation with the unions to work out a satisfactory schedule of pay and rules. On July 1, 1942, there was placed in effect a schedule providing for "standard" (eastern lines') pay scales and bases; separate yard and road crews within the Peoria terminal district and compensation for road crews for all yard work performed at outlying terminals. The new schedule made necessary the addition of two additional yard crews at Peoria.

Throughout his negotiations the federal manager sought, and obtained in great measure, qualifications of standard rules providing the flexibility which the T. P. & W. required. Thus, for example, by special agreement, extra yard engines could be started at any time required by traffic conditions. At Peoria, three regularly-assigned crews worked "around the clock." The two additional crews used almost daily during the war could be called as needed, without regard for the periods designated in "starting time rules." Again, so long as crews did not enter the designated terminals of Peoria, Hamilton or Effner, there were no restrictions upon the routing, or layover point, of a trip which could be made on a continuous mileage basis. Turn-arounds could be operated between any combination of points, except the three terminals cited. Twenty-four hours' advance notice was sufficient to establish a regular assignment. The latter could be made for but one day, provided the bulletin so stated.

All irregular runs as a result of emergency operating conditions could be paid for on a continuous mileage and time basis, without the additional basic day's pay incurred by many roads under similar conditions.

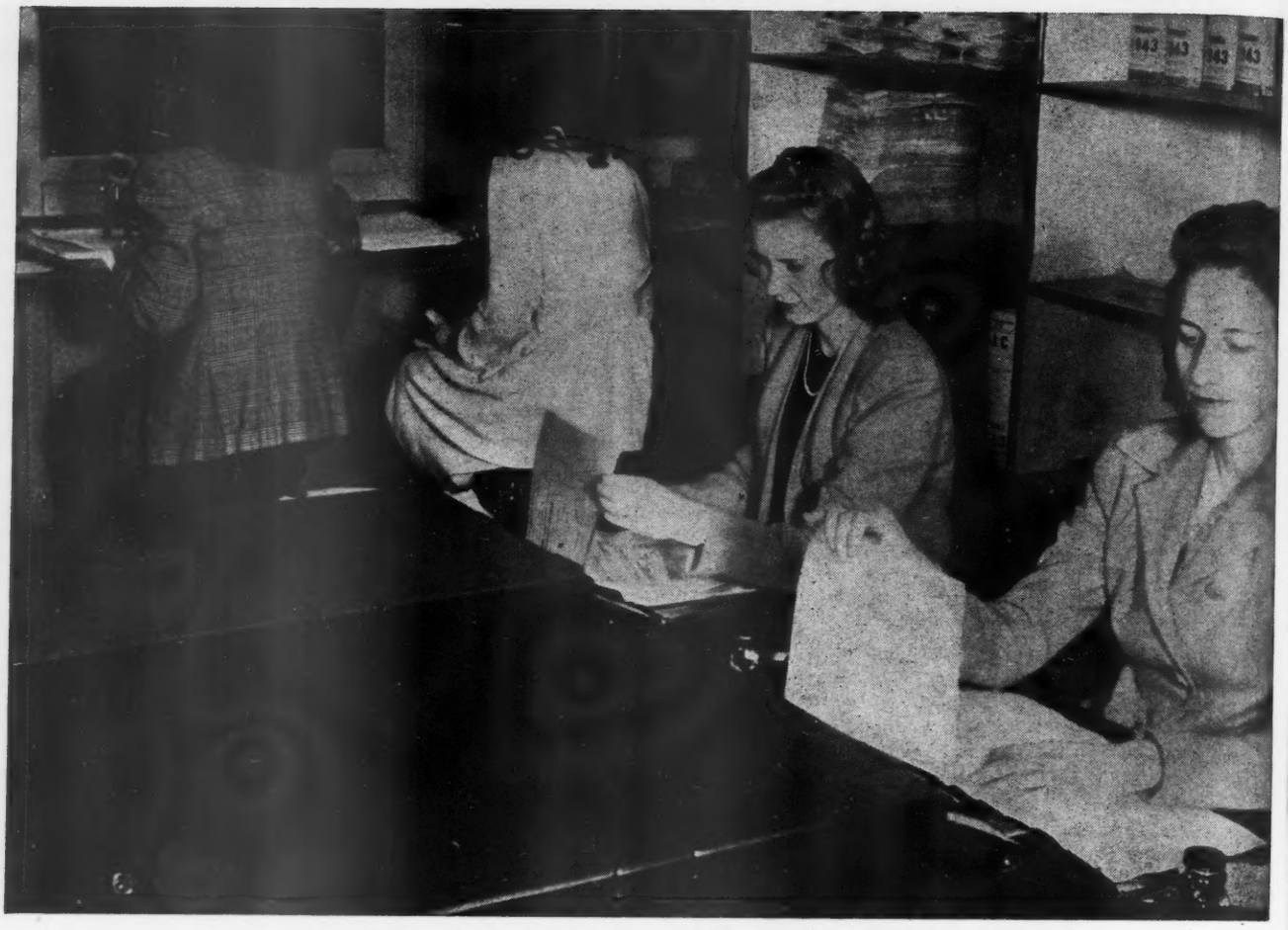
Through freight crews could make up to three pick-ups or set-outs at intermediate stations before converting to local freight service pay. Furthermore, no limitation was set on stops to set out bad order cars. No yard service penalties were incurred by the federal manager when road freight crews performed switching at intermediate stations (except Peoria). And while such switching converted the pay basis from through to local, a supplemental agreement with the unions stipulated that spotting a car of livestock or perishable freight did not constitute switching, and could be performed at through rates, up to the limit of three.

During 1943 the federal manager was active in the endeavor to establish an increased number of reciprocal transfer runs at Peoria (where the T. P. & W. interchanges with 13 other roads) pursuant to the general principles agreed upon by a committee of railroad presidents and brotherhood officers in November, 1942, to ease the manpower shortage.

In May, 1943, O. D. T. Director Eastman told the House military affairs committee that the T. P. & W. agreement negotiated by the federal manager "is better from management's viewpoint than that of any other road in the surrounding territory."

Shortly after the end of hostilities

(*Continued on page 623*)



Operators photographing railway forms on Commercial-type cameras. This equipment is used to microfilm all loose-leaf statements or forms up to a width of 14 in.

One Road Microfilms 25 Million Records

This process, used to photograph 80 tons of documents, saves the D. & R. G. W. valuable storage space, releases numerous filing facilities and provides protection in case of fire

By D. K. TAYLOR

Supervisor of Records
Denver & Rio Grande Western

SINCE launching an experimental microfilm project in 1942, the Denver & Rio Grande Western has reduced 80 tons of vital records to several pounds of microfilm. By the latter part of 1946, approximately 25,500,000 documents had been filmed, and the original forms destroyed. Accounts, records and memoranda have been retained on compact films, instead of bulky, voluminous records. These films are available for guide research or reference on a film reader.

The cost of this work has averaged 0.0035 cents per document, while salvage valued at $510 has been realized from the sale of waste paper. Furthermore, eight miles of shelving, 43 four-drawer file cabinets, and 325 binders have been recovered. These, plus the savings in time formerly required to search for records, have helped offset the cost of the microfilming program.

As every railroader knows, Interstate Commerce Commission regulations require that all accounts, records, and memoranda be retained for varying specific periods of time. The commission's "Regulations to Govern Destruction of Records of Steam Railroads" reads in part:

Section 110.2(b) Photographic copies—Steam railroads may be granted authority to preserve photographic copies of certain records in lieu of original records or copies thereof. Application for authority shall be filed in the form of a letter which shall describe the particular records intended to be preserved by this method and the process to be used.

In addition to satisfying these minimum requirements, the D. & R. G. W. retains many records for a longer period. Specified periods for keeping original records are indexed by form number in the road's Manual of Procedures. After the records are kept for the prescribed time, they are destroyed upon request by the department head concerned. The

general auditor has been designated by the trustees and the board of directors as the officer with sole authority to approve the destruction of records.

Filing Systems Standardized

When the D. & R. G. W. appointed a supervisor of records, the first step was to organize and administer systems for the retention, maintenance, and destruction of all correspondence files, reports and other company records. Current file systems were revised by a staff of filing experts, who visited each office throughout the system. Identical indexing for the files of agency tariffs at each office, for example, has proved a definite aid to agents being transferred from one agency to another, as well as for any person making an inspection of tariffs.

All operating department offices, including those of the trustee, general manager, assistant general manager of transportation, superintendent of transportation, and of each of the four division superintendents, have uniform, numerical file systems. The identical subjects in each file are assigned identical numbers. For example, a file on "rail specifications" has been assigned a number, and any office which has a file on this subject has it filed under this same number. This uniformity is a great aid when there is correspondence among the various offices. All records, except extremely large ones, are filed vertically, and all storage file drawers are labeled with the department name, title and dates of material, file number, I. C. C. item number, and the date when the contents should be microfilmed or destroyed.

After the new filing system was in full operation, a survey of stored records was made, and those which were due for microfilming were set aside. At the beginning of the microfilming program, two Commercial-type Recordak cameras were operated three 8-hour shifts each day. Later, a Micro-File Recordak for recording large documents and books on 35 mm. film was installed. Now that the bulk of records are photographed, the schedule has been reduced to one shift each day, and all records which lend themselves to microfilming are filmed currently.

The master negatives are filed in steel humidified cabinets which are stored in fireproof vaults at the general office. These records are completely indexed and cross indexed according to departments, and also by form numbers, for quick and easy accessibility. Six film readers are available in the storage vault, and file clerks are always on hand.

When the exposed microfilm of certain D. & R. G. W. documents are developed, extra positive film prints are obtained to provide a duplicate file for the division offices. Each of these offices is provided with a steel humidified film cabinet, and a film reader which is designed to accommodate both 16 and 35 mm. microfilm. Hence, the division offices have their own permanent files of train sheets on 35 mm. microfilm, as well as personal records, A. F. E.'s (authorities for expenditure), investigations, correspondence, etc., on 16 mm. microfilm.

When using the Commercial-type camera, single-sheet documents up to 14 in. in width (and without limit in length) can be microfilmed automatically, with a standard reduction ratio of 24-to-1. When these film records are viewed on the screen of a film reader they are magnified 23 times, to near their original size.

Large documents, such as train sheets, are photographed on 35 mm. film, using a Recordak Micro-File camera. Both sides of the sheets are microfilmed, and each side is recorded in three exposures, or one-third of a side in a single exposure or "frame." The film reader used (Model C) accommodates 35 as well as 16 mm. microfilm. The viewing screen of the film reader is adjustable so that the magnification can be varied from 12 to 23 diameters. At a magnification of 15 times, for example, the entire image can be viewed on the screen, a feature which saves time when searching for a particular sheet. Once the required train sheet is located, the desired image can be magnified to 23 diameters for ease in viewing. Then, with a scanning device, operated by a hand lever, the image can be moved about over the screen so that any notations can be viewed easily and accurately when transcribing information.

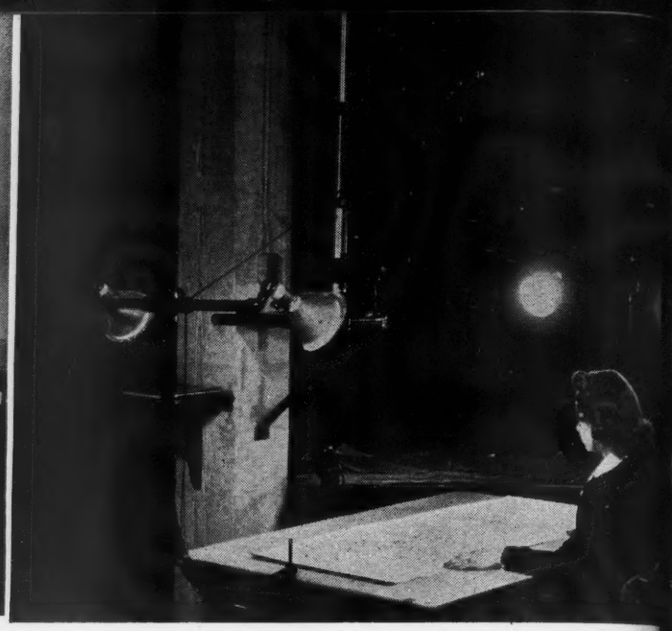
Many Uses for Microfilm

Virtually every department of the D. & R. G. W. uses the Microfilm service. The largest volume comes from the accounting department. Interline settlements and claims together make up the biggest single item of this group. More than 3,400,000 accounting forms—which, normally, would be kept for four years after settlement—have been microfilmed and destroyed.

Interline waybills which must be retained for six years accumulate at the rate of approximately 475,000 a year. Local waybills accumulate at the same rate. To date, over 2,500,000 of these have been condensed on film, and the originals destroyed.

Vouchers and accompanying papers, which must be kept for ten years, were another big problem. Under the old method of filing, 4,600,000 of these documents averaging 8½ in. by 11 in. were filed, but they have now been condensed to microfilm and the originals destroyed. The I. C. C. requires that the form

Left—Through the use of a film reader, the microfilm image of train sheets can be magnified 23 times. Right—Prior to the inauguration of microfilming, the storage of train sheets, in sizes from 17 in. by 42 in. to 21 in. by 90 in., presented a big problem



Left—The file clerk shown is holding 253 microfilm train sheets, formerly measuring 18 in. by 78 in., all of which are filed in steel cabinets. Right—For photographing right-of-way maps, station profiles and other documents too large for the Commercial-type equipment to handle, Micro-File cameras, which use either 16 or 35 mm. film, are used

covering A. F. E.'s be kept as a permanent record. To date, the D. & R. G. W. has filmed 367,500 pages of this form, plus the maps which accompany them. The personnel department and division offices have on film all records for retired and deceased employees, and personal records of employees out of service five years or more. In addition, approximately 600,000 payrolls have been microfilmed for the treasury department.

For the transportation department, bulky daily reports, which formerly presented a serious problem of floor space and filing cases, have been microfilmed and condensed to less than 2 per cent of their original size.

Dispatchers' train sheets, one of the largest of D. & R. G. W. documents, presented a complex problem from the standpoint of storage because of size—one form being 1½ ft. by 7½ ft. Since the installation of microfilming equipment all train sheets are now being photographed on 35 mm. microfilm.

Photographing train sheets vividly illustrates the value of microfilming as a means of saving storage space. Various ratios of reduction are used, depending upon the size of the sheet. Both sides of the sheet are photographed, three exposures to a side, in such a way that the images appear crosswise on the film. For a sheet measuring 1½ ft. by 7½ ft. both sides represent a document 15 feet. long. Recorded on 35 mm. film at a reduction of 27 times, the actual length of film required (six images) is only 4¾ in.

A total of 253 such train sheets can be recorded on a standard (100-ft.) roll of 35 mm. film, small enough to hold in the palm of one's hand. Sixty rolls of microfilm can be filed in a single drawer of a Recordak film file, or more than 15,000 condensed "train sheets." In six drawers of the file, 360 rolls of film, or over 91,000 train sheet records, can be stored.

Microfilming Procedure

All requests for the microfilming and destruction of records are made through the records office. Material sent for filming must be accompanied by a letter of transmittal. D. & R. G. W. Form 405—"Application for Authority to Destroy Accounts, Records and Memoranda," is also sent in when the material is to be destroyed.

Form 405, the application, also notifies the supervisor of records which accounts, records and memoranda are to be destroyed, and which are to be microfilmed. Another form, (406)—"Report of Destruction"—accompanies the application Form 405, and provides the general auditor with a record of accounts, records and memoranda destroyed.

The letter of transmittal contains the following information:

1. Department.
2. Form number and name.
3. Dates—beginning and ending.
4. Order in which material should be filmed, by date, location, alphabetically, etc.
5. Destruction information. If material may be destroyed after filming, enclose Form 406, properly filled out, and approved.
6. Whether material is to be returned to the department after filming, or held a certain length of time before being destroyed.
7. Indexing information.
8. Name and telephone extension of person to call in case of question.

A complete card index is kept up to date as the material is filmed. This includes the film number, drawer number, section number, and box number where every microfilmed item is filed. Facsimile prints from the microfilm can be obtained by written request to the supervisor of records.

A cost analysis is made each week, showing the number of documents processed on each microfilming machine; the film footage used; the cost per 100 documents; and the film footage per 100 documents. Irregularities affecting the cost are also shown.

At the end of each month, a summary of documents microfilmed and destroyed is prepared, providing a running summary of all documents filmed from the beginning of the program to and including the current month. Copies of this report are distributed to officials and department heads affected by the current month's work.

The destruction of all railroad records is governed by I. C. C. regulations, but if a carrier desires to destroy any records not listed in the I. C. C. "Regulations to Govern the Destruction of Records of Steam Railroads," it may petition the commission to that effect, and authority is usually granted to preserve photographic copies of certain records in lieu of original records or copies thereof. However, the method of destroying the original records is not prescribed. The I. C. C. is not concerned with the method, so long as the destruction is authorized, and a certificate of destruction is filed, as required by the regulation. On the other hand, if the carrier sells or disposes of the records, other than by destroying, the certificate must so state. The Interstate Commerce Act, of course, provides that a carrier shall not divulge information concerning a shipper or consignee. To safeguard against this possibility, the D. & R. G. W. shreds material before selling it for salvage, and cremates papers containing confidential information.

A.R.E.A.

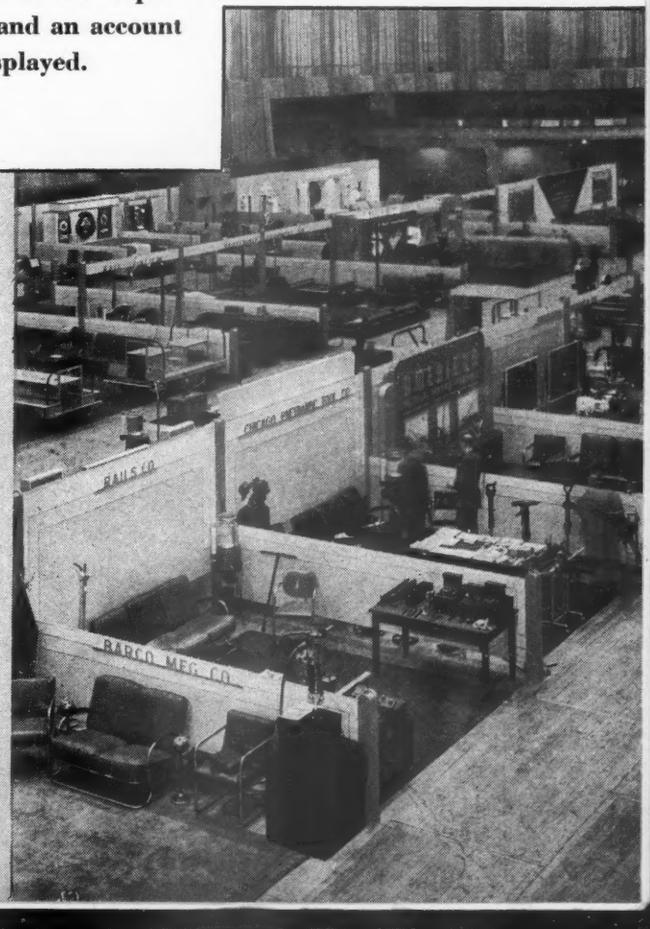
Convention Section

Contents

This section contains a complete account of the convention held at Chicago on March 18-20, including abstracts of all the addresses and committee reports that were presented, and pertinent comments made in discussion from the floor. It also contains a list of all the companies participating in the exhibit of the National Railway Appliances Association, including the names of the representatives present and an account of the products displayed.

N. R. A. A.

List of Exhibitors



Many Problems Studied During Busy Session

Much constructive work in the interest of an improved fixed plant was accomplished at the forty-sixth annual meeting of the American Railway Engineering Association

ANNUAL "Engineering Week" got off to an auspicious start on Monday, March 17, when the National Railway Appliances Association opened its largest exhibit in two decades at the Coliseum, Chicago, and wound up on Thursday with the close of both the exhibit and the forty-sixth annual convention of the American Railway Engineering Association at the Palmer House. The latter meeting was a three-day session packed with constructive committee reports and addresses dealing with subjects of interest to, and problems confronting, engineering and maintenance officers of this country and Canada. By every standard of measurement—attendance, the nature and amount of work accomplished, and the interest manifested by those present—the meeting was an outstanding success.

There was no single feature of the A.R.E.A. meeting that could be said to dominate the program, the entire proceedings being permeated by a single thought, or keynote, namely, the problem of providing, at minimum expense, tracks and structures built to the necessary standards to satisfy today's stringent operating requirements and those in store for the future. Reflecting the mood that is so prevalent in the railroad industry today—a mood that has been conditioned by the challenge presented by other modes of transportation and the need for keeping expenditures in line in view of soaring wage and material costs—the meeting of the A.R.E.A. was a business-like session throughout.

The pattern of the meeting was similar to that of previous peace-time years, with the first session being held on Tuesday morning, March 18, and the final session on Thursday morning, March 20. The regular sessions were given over for the most part to the presentation and discussion of the re-

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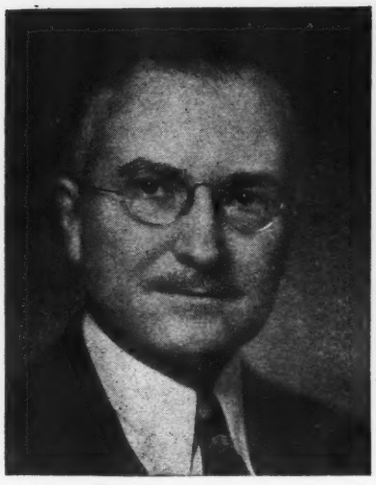

Walter S. Lacher
Secretary

ports of the association's standing committees. These included reports by 22 committees on a total of 95 subjects covering a multitude of problems confronting engineering and maintenance officers. On a number of occasions during the meeting the reports of certain committees were supplemented by addresses dealing with subjects closely related to the committee's work or describing the results of research projects being carried out under the auspices of the particular committee.

The convention was opened on Tuesday morning with an address by J. B. Akers, president of the A.R.E.A., and chief engineer, Southern, which was a catalog of the progress made by, and the problems confronting, the association. Following the address by Mr. Akers came the annual reports of the secretary and of the treasurer. In his report, Walter S. Lacher, secretary, said that on February 1 the association had a total of 2216 members of all classifications, the largest since February, 1932. During the last year, he said there was an increase of 109 in the membership, the largest for any year since 1928. Reporting on the association's publications, Mr. Lacher said that the number of pages in the seven bulletins ending with that for February, 1947, totaled 1014, or 233 pages more than in the seven bulletins ending with February, 1946, but 291 pages less than in the seven bulletins ending with February, 1945. The disparity compared with two years ago is due to the unusual size of the bulletins published in the summer of 1945, because, so far as committee report material is concerned, the number of pages produced in the last year was much above the normal of recent years.

Opening Session Addresses

An outstanding feature of the opening session was an address by Col. R. S. Henry, assistant to the president, Association of American Railroads. Addresses were also made during this session by L. B. Porter, chairman, Signal section, A.A.R., and superintendent telegraph and signals, Chicago, Milwaukee, St. Paul & Pacific, and by K. H. Gordon, chairman, Electrical section, A.A.R., and assistant electrical engineer, Pennsylvania. The principal purpose of the addresses by Mr. Porter and Mr. Gordon was to bring the members of the A.R.E.A. up to date regarding the activities of the Signal and Electrical sections, respectively.

A highlight of the opening session was the presentation of an honorary membership in the association to a railroad engineer who had attained outstanding eminence in the field. This was D. J. Brumley, a past-president of the association, and retired chief engineer, Chicago Terminal Improvements, Illinois Central. The award was received in behalf of Mr. Brumley, who could not be present, by C. H. Mottier, vice-president and chief engineer, Illinois Central.

During the annual luncheon on Wednesday noon those present had an opportunity to learn what railroad management is thinking of the engineer and his work and of railroad problems in general. The agency for this knowledge was an address by Champion McD. Davis, president, Atlantic Coast Line.

All the other addresses presented during the convention were of a technical nature and dealt with several of the more pressing problems confronting the railway engineering field today. Among these was an address by Ralph B. Peck, research assistant professor of soil mechanics, University of Illinois, Urbana, Ill., on "Soil Mechanics As Applied to Railroad Roadbeds," which was presented during the Wednesday morning session immediately after the report of the committee on Roadway and Track had been received. In view of the increasing attention being given to the stabilization of roadbeds by different methods, Prof. Peck's address attracted keen attention.

Three other addresses, all presented during the Wednesday afternoon session immediately following the report of the Committee on Rail, dealt with various aspects of the rail problem. Among these addresses was one prepared by N. J. Alleman, special research associate professor in engineering materials, University of Illinois Talbot Laboratory discussing the joint bar studies now being made at the University of Illinois,

which address, in the absence of Professor Alleman, was read by R. S. Jensen, special research associate at the University of Illinois. Another address was by R. E. Cramer, special research professor, University of Illinois, in which he summarized certain highlights of the various investigations of rails now being made at that university. A third address by G. K. Manning of Battelle Memorial Institute, Columbus, Ohio, dealt with the study of shelly rails that is now in progress at that institute.

The regular sessions of the meeting were presided over by President Akers, assisted by Vice-President A. Chinn, president, Terminal Railroad Association of St. Louis, and by Secretary Lacher. The registration at the meeting included 825 members and 665 guests, a total of 1,490, which compared with a registration of 723 members and 614 guests, a total of 1,337, at the 1946 annual meeting.

Election of Officers

The following officers were elected to direct the affairs of the association during the ensuing year: President, Armstrong Chinn, president Terminal Railroad Association of St. Louis, St. Louis, Mo.; vice-president to serve for two years, F. S. Schwinn, assistant chief engineer, Missouri Pacific Lines, Houston, Tex. The directors named were T. A. Blair, assistant chief engineer, Atchison, Topeka & Santa Fe system, Chicago; W. D. Simpson, chief engineer, Seaboard Air Line, Norfolk, Va.; and H. S. Loeffler, assistant chief engineer, Great Northern, St. Paul, Minn. Members of nominating committee are A. B. Chapman, engineer and superintendent bridges and buildings, Chicago, Milwaukee, St. Paul & Pacific, Chicago; E. C. Vandenburgh, chief engineer, Chicago & North Western, Chicago; G. W. Miller, district engineer, Canadian Pacific, Toronto; A. B. Stone, assistant chief engineer, Norfolk & Western, Roanoke, Va.; and J. E. Bernhardt, bridge engineer, Chicago & Eastern Illinois, Chicago. In addition, C. H. Mottier, vice-president and chief engineer, Illinois Central system, Chicago, and vice-president of the association, was advanced automatically to senior vice-president, succeeding Mr. Chinn.

Immediately following are presented abstracts of the addresses by President Akers and by Messrs. Henry, Porter, Gordon, and Davis. Also included are abstracts of all the committee reports, along with the discussion and action which followed their presentation. An abstract of the address by Prof. Peck appears in connection with that of the report on Roadway and Ballast, while abstracts of the addresses by Profs. Alleman and Cramer are combined with that of the report of the Committee on Rail.

President's Address

Pointing out, at the outset of his address at the opening session, that the membership of the association is now the largest since 1932, President Akers said that "we are not looking for increasing membership for the sake of numbers, but always welcome new members in the hope and expectation that they will add to the effectiveness of the work of the association; that they will bring forward new thoughts and ideas, pushing further into the hazy realm of things little understood at present".

Next, President Akers referred to the increasing importance of the Manual of Recommended Practice "as the authoritative word whereby railroads are operated and maintained" and said that, while "we are happy to observe this growth in use, it is in itself a challenge to us. We must see to it that the conclusions published in the Manual are truly representative of best practices; that they are unquestionably sound professionally, and that when practices become outmoded they are replaced by those which are valid". This can only be done, he said, by "zealous attention and care on the part of all members, and by keeping an open mind when considering the traffic in fresh ideas, unexpected opinions, fresh solutions, and ingenious compromises".

Turning his attention to a discussion of committee work, President Akers pointed out that there are approximately 290 more pages in the reports for this year than last year, indicating a fine recovery of committee activities since World War II. "We must always place the accent on committee work", he said, and added that the "underlying strength of the association is in its committee work, and that it is definitely in our interest to carry forward that work in the best manner possible".

He then went on record as being in favor of permitting younger men to participate in committee work. "A substantial portion of our membership", he said, "is in the grade of junior officers and engineers who perform the actual work of planning and designing. It is our observation that these young men are perhaps not permitted to attend committee meetings or annual meetings to the extent that would be desirable for the health and growth of the association. It is our earnest hope that the various railroads will permit these younger men to attend meetings as much as possible. I am sure it will increase the value of these men to the organization. I have come to believe that these younger men bring a great deal of knowledge and enthusiasm to our group, and that they reap handsomely from association with others of greater experience".

The increasing importance of research and development as activities of the association was discussed next by President Akers. Through such activities, he said, "there are wide opportunities for advancement that will open doors for us, and make it possible for us to render better service". He announced that the recommended budget of $209,428 for research and development work in 1947 had been approved, and that this figure represents a considerable increase over former years.

The final phase of President Akers' address dealt with the problem presented by the necessity of attracting engineering graduates into the railroad field. Noting that the reports of the Committee on Cooperative Relations with Colleges and Universities indicate that railroad employment is not particularly attractive to engineering graduates at present, President Akers asked: "Why is this? Why can't we reverse this trend?" Answering the latter question, he expressed the belief that the trend could be reversed by creating more opportunities for the advancement of engineering graduates and by seeing to it that professional growth on the railroads is comparable to that offered in other industries.

Railroads Must Have Higher Return

The crying need—from the standpoint of the nation's welfare—for the railroads to be permitted to realize an adequate return on the investment in them, was the keynote of the address by Col. Henry at the opening session. He began his remarks by a discussion of the things that are new on the railroads. While, "there is an eye-catching quality about locomotives and cars, which insures popular interest in their development and improvement", he said, "there are other things on the railroads which lack this eye-visibility but which, nevertheless, are importantly new".

He then went on to cite examples of less dramatic aspects of the railroad plant, and showed how they have been improved over the years. This portion of Col. Henry's comments included reference to railroad tracks and how "they are heavier, stiffer, stronger, safer, more durable, as the result of the con-

centrated research of railroad men and supply men". He also traced the improvements that have been made in yards, signals, and train communications.

"Altogether", he said, "these and other improvements to the field properties of the railroads, and in the cars and locomotives which run over them, represent an annual expenditure totaling, in the past 25 years, more than $13 billion—an average of more than $500 million a year. This was not government money lavished on the railroads. It was railroad money. Where did this money come from?" At this point Col. Henry was careful to point out that this money did not come from raising railroad rates and fares, from lowering wages for employees, or from reduced taxes, but that it has come partly from increased efficiency, as the result of the improved plant and equipment which increased investment has made possible.

A part of this money, he said, comes out of the return earned on the private capital invested in the railroads, and from here he went on to note that, while railroad earnings 20 years ago amounted to nearly 6 per cent of the net investment in the property, after depreciation, the return last year, although the railroads handled the heaviest volume of traffic ever known in peace time, was only 2¾ per cent, and that in 1947 it is expected to be hardly any greater. Col. Henry concluded:

"We know—and the experiences of the past decade have brought all of America to know—that this nation can neither carry on business nor make war successfully without adequate rail transportation. We all know that the best way, and indeed the only way, to have that sort of transportation is through adequate maintenance and support of privately-owned and business-operated railroads. And that means that these railroads must be allowed a chance to earn a return averaging, for the railroads as a whole and through the years, not less than 6 per cent on their net investment in the tracks, the cars and engines, and all the other railroad facilities at the public's service."

Engineer's Challenge

Mr. Davis' address before the annual luncheon on Wednesday was primarily a discussion of "the part engineers may be called on to play in support of railroad management in solving the broad and varied problems of running the railroad industry", although he prefaced his comments in this respect by a review of the program that the A. C. L. has carried out in recent years to rehabilitate its rolling stock and fixed properties.

He then referred briefly to the struggle of the railroads during the war years to handle a huge burden of traffic with inadequate materials and equipment. These battles, he said, were won and "today we find ourselves in a fast-moving, highly-competitive transportation period. The public—our customers—whose praise is yet ringing in our ears, will continue to patronize and encourage us only so long as we provide modern, progressive transportation, keeping pace with ever-advancing developments. Herein lies a challenge to the engineers of our industry, and I feel confident that the A.R.E.A. is alert and ready to form the spearhead for advancing standards and methods in keeping with latest practical developments".

If the railroads are to obtain and retain a fair share of the traffic and travel which will move by all transportation agencies, he said, "it is essential that our physical plant, including tracks and structures, as well as power and equipment, be continually maintained in keeping with efficient and modern developments. The public," he continued, "is entitled to demand the most expeditious and efficient transportation possible, including the most desirable comforts and travel diversions for passengers. To meet that demand we must not only take advantage of all presently known developments but must also constantly cast about for future, unforseen improvements. In this field of research and analysis we depend on the leadership of the engineers". In this connection Mr. Davis argued in favor of active collaboration on the part of various railroads with the A.R.E.A., stating that "all railroads should unselfishly cooperate with the A.R.E.A. by permitting the use of their plants for tests, and extending the services of their engineering personnel in solving difficult problems".

"In so far as the problem of profitable operation is concerned", he said, "we must constantly strive for greater efficiency, must face the fact that wage levels and material price levels will probably continue high, and must exert our utmost ingenuity to seek ever more efficient methods—this is where our engineers prominently stand out in this vital picture. I need not elaborate on that angle of the problem because it is a well known and historical fact that the railroad industry has been able progressively to meet increased costs of conducting its business by continuously increasing efficiency of operation".

Signaling Progress

The address by Mr. Porter was a comprehensive discussion of recent developments and trends in railway signaling. Some of the subjects discussed

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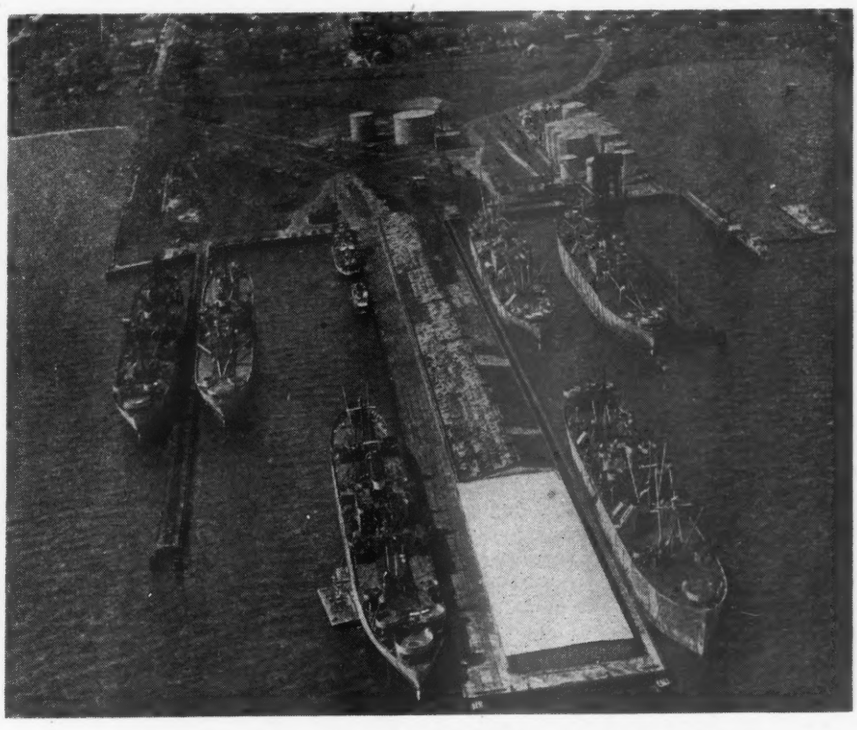

Pensacola, Fla., ocean terminal facilities of the St. Louis-San Francisco, recently improved by dredging to 33-ft. depth

by Mr. Porter included the use of radio for transmitting centralized traffic control codes; thermal units to detect hot journals on passenger coaches; use of modern signaling as a factor in obtaining the fullest possible utilization of Diesel power; features of coded track circuits as used in centralized traffic control installations; improvement in automatic block systems whereby the dispatcher is furnished visual information on the movement of trains, with the control of certain key signals being placed in his hands; the necessity, when planning signaling systems, of making studies that will consider collectively all pertinent factors; the fact that much of the signaling of the country is in need of renewal and rehabilitation; renewed activity during the past year in the installation of protection systems at highway-railroad grade crossings; and developments in communication systems, in cab signaling and in the installation of car retarders at classification yards.

Turning his attention to "some of the matters on which closer coordination and cooperation would be advantageous, Mr. Porter spoke in part as follows:

"C. T. C. installations usually involve considerable track work, such as the elimination, relocation, or extension of sidings; refitting of switches; drainage; grading; banking; and the placing of insulated rail joints and other details. It is also desirable to schedule new signal construction with track programs involving rail renewals, reballasting, rail-end treatment, the moving of switches and the rearrangement of yards, and like work, in order to avoid duplication of effort and later changes.

"Opportunities for effecting greater economies are presented through the use of C. T. C. and the conversion of double to single track with sidings properly located. The experience of a number of roads that are successfully handling heavy volumes of traffic on single track affords proof that there are sections of second track that could be retired without serious loss of operating efficiency. Projects of this kind result in substantial economies, and when properly timed may avoid heavy expenditures for track renewals. The Signal section has prepared considerable factual data on these subjects, which is now available.

"Considerable difficulty is experienced in maintaining interlocked switches in proper adjustment to meet the obstruction tests prescribed by the Interstate Commerce Commission. To overcome this difficulty, heavier fittings, additional bracing and improved tie rods are called for in many instances. Collaboration in the design of the end rails and locking features of drawbridges, and the application of insulated joints in crossovers and on crossing frogs is desirable in meeting I. C. C. requirements. Cooperation in planning electric and gas heater installations for snow melting is desirable.

"A greater use of labor-saving tools by signal maintenance and construction forces will result in increased economy and efficiency. Camp cars with modern appliances and conveniences should be provided for regularly assigned road crews. Additional motor car set-offs are needed at many points."

Electrical Trends

In his address at the opening session Mr. Gordon first reviewed briefly the work accomplished at the 1946 meeting of the Electrical section, noting that the report for that year contained two specifications and two recommended practices, one of the specifications being for electric heaters for track switches. Rather than attempt to give a detailed review of this report, Mr. Gordon outlined some of the more recent developments in the use of electricity by railroads.

Among the developments described was the use of relatively high voltage distribution circuits in large shops, and the use by one railroad of an ingenious device for measuring the life remaining in batteries turned in by employees for replacement (pointing out that at one distribution point 52 batteries were tested within a period of one week, of which 31 were returned to service, with a resulting total saving of 781 hours of battery life). Mr. Gordon also discussed the belief of many electrical engineers that the availability of the mercury-arc rectifier in its modern form will result in the use of direct current motors in the many applications where their inherent characteristics are superior, and where alternating current motors have been used because no supply of direct current was readily available.

Mr. Gordon also gave a brief account of the findings to date of the field tests of electrolytic corrosion of steel in concrete, which are being conducted under the supervision of the research engineer, Engineering division. These tests have demonstrated so far, he said, that asphalt waterproofing is quite effective in preventing electrolytic corrosion; that the thickness of concrete or the use of admixtures has little effect; and that the use of steel encasements resulted in deterioration of the concrete for the particular conditions of the test.

Although there have been no spectacular, new developments in electric lighting, Mr. Gordon said that the extension of the use of mercury-vapor lamps for shop lighting and of fluorescent lamps in offices and shops has received considerable attention. The growing demand for fluorescent lighting on passenger cars, he said, has brought about the need for a means of producing a satisfactory supply of alternating current on these cars. For accomplishing this end, he said, a unit known as the Amplidyne Booster Inverter* has been developed.

Regarding developments and the use of electricity in railroad communication systems, Mr. Gordon made particular mention of the use of high-frequency carrier current, by means of which an almost unlimited number of messages can be transmitted simultaneously over an existing wire line; the teletypewriter exchange system, in which teletypewriters are connected through exchanges in trunk lines in the same manner that telephones are connected for a conversation; loudspeakers at passenger stations, in yards, on wreck trains, and on passenger trains; facsimile communication for transmitting train orders; radio telephones on tugboats to provide communication with the tugboat dispatcher; mobile radios for communication with yard engines, motor trucks and automobiles; and train telephone systems for communication between train and wayside offices, between two trains, and between the ends of the same freight train.

Location---Operation

F. N. NYE, Chairman†

This committee submitted reports on four of its nine assignments, including revision of the Manual, of which three were progress reports presented as information, and the fourth was a final report.

Revision of Manual—In a progress report on this subject, the committee recommeded the inclusion of data for a third section in the Manual on Economics of Railway Operation, which is intended to supplement existing sections on Economics of Railway Location and Power. The new section submitted deals with the development of an absolute expression for track capacity, referred to as potential track capacity, for comparing the track capacity actually used in any operation with the absolute maximum which can never be realized; the development of a graphical method for representing and comparing operating statistics; the selection of comparable test periods for studying the effect of any improvement in equipment or fa-

* See the *Railway Age* of March 1, 1947, for a description of the use of this device as applied to passenger cars on the Pennsylvania.

†*Assistant to General Freight Traffic Manager, New York Central, and formerly Engineering Economist for the road.*

cilities, or changes in operation methods; the effect of speed limits, motive power capacities, and freight train performances; the effect of volume of traffic or the determination of train tonnage for best average road time; a form for calculating typical train-hour diagrams from train-performance charts; a method for estimating the maximum number of trains that can be operated over a given section of railroad; the general effect of passenger trains on freight train performance; an example that indicates the procedure in regard to the application of investment costs and operating expense units; and other cases that can be similarly analyzed.

This report was presented for comment and criticism with the intention of submitting it next year for adoption.

Length of Side Tracks—On its assignment to investigate methods or formulas for the solution of special problems relating to more economical and efficient railway operation, a subject continued from last year, the committee made minor revisions in the formula for siding lengths for freight trains and recommended that it be adopted and published in the Manual. This recommendation was approved.

Higher Train Speeds—The committee offered as information a progress report on its assignment to investigate the effect of higher train speeds on railway revenues, operating expenses, and charges to capital account. Because operating speeds, train weights and service conditions are widely different for freight and passenger services, the study was divided into two parts, Part I dealing with passenger service, the phase which was presented at this time, and Part II with freight service, which will be presented at a later date. Each part is subdivided to cover the effect on charges to capital account, operating expenses and railway revenues.

The report on Part I states that, although there are many factors which influence capital and operating costs, the main factors are profile and alinement of track, weight of train, type of motive power, type of service, number of high-speed trains, utilization, and maximum train speed. Fixed conditions were assumed for the first six factors and the trend was established with the maximum speed increasing from 80 to 120 m.p.h. In determining this trend, the committee also assumed that the high-speed passenger trains were powered by Diesel-electric locomotives, because of the advantages of this type of motive power, although it discussed other types as well.

The committee summarized its study of Part I of its assignment by stating that high-speed passenger trains can be profitable if enough potential travelers are available; that much improvement work must be done to make tracks suitable for speeds of 100 m.p.h. or more; that increased expenditures are justified to bring about further reduction in weight of cars and locomotives; that the utmost in streamlining does not appear to be economical; that the maximum train size that the traffic justifies is most economical; and that an analysis of other factors which influence first cost and operating expenses will show possibilities of marked reductions in cost. The report was supplemented by an appendix containing tables and graphs and explanations of their origin.

Coordinated Highway Service—In a progress report on its asignment on coordinated highway service and its effect on the economics of railway operation, the committee selected excerpts from the exhaustive report on Highway Motor Transport by the Subcommittee on Motor Transport of the Association of American Railroads and presented them as information. The excerpts deal with the foreword, comments, conclusions and recommendations, and summary of the report.

As presented, the report notes the remarkable development in the automotive and highway fields brought about by technological improvements and mass production, and cites comparative costs of building automobiles and highways in 1910 and 1941. It shows that, while the initial and maintenance costs for an automobile have decreased considerably since 1910 for the much better motor vehicle of 1941, the cost of constructing improved highways has increased to the point that, in 1941, it ranged from $40,000 to $70,000 per mile of two-lane highway, and from $100,000 to $700,000 a mile for a modern four-lane highway.

The high cost for modern highways is brought about by the small minority of total trucks that are operating in the long-haul field, which minority requires the building of highways stronger and wider than those needed by the private automobile and local truck.

Concerning the volume of traffic, the report states that it appears that bus traffic will continue to be heavy until private automobile usage returns to pre-war proportions, and that it seems likely that motor carriers in freight traffic will handle a total ton-mileage at least equal to pre-war proportions and probably greater. Indications are that private operators will handle more than the pre-war figure of 50 to 60 per cent of all motor carrier traffic and that the common carrier may decline from its pre-war amount of 20 to 25 per cent.

Water Service

E. M. GRIME, Chairman*

Reports on seven of its nine assignments were presented by this committee, including revision of the Manual, four progress reports presented as information, and two final reports, also presented as information.

Revision of Manual—The committee recommended a change in specifications for hydrants and valves to cover the more recent ones of the American Water Works Association. This change was adopted.

Pitting and Corrosion in Locomotive Boilers—On its assignment to investigate the cause and remedy for pitting and corrosion of locomotive boiler tubes and sheets, with special reference to the status of embrittlement, the committee offered a progress report as information. This report states that the results obtained from the use of sodium nitrate, and also from various organic compounds, are continuing to be satisfactory. It also states that the original welded boiler placed in service on the Delaware & Hudson is operating satisfactorily, and that several more welded boilers are being put in service or are on order by other railroads.

Governmental Regulations Pertaining to Railway Sanitation—In a progress report on this subject, submitted as information, the committee reported that, through an authorization of funds by the A. A. R., a consultant director on sanitation research, together with other personnel, had been retained, with headquarters at the Mt. Clare shops of the Baltimore & Ohio at Baltimore. The immediate objective of this group is the study and development of a satisfactory means for the handling and disposal of the toilet wastes from passenger-carrying railroad cars.

The activities of the project include an epidemiological study of the present methods of disposing of human excreta on railroad rights-of-way and at terminals; a review of the past research and development on the problem of sewage handling and disposal; the installation of test apparatus on cars in service to determine the habits of passengers in using the toilets, and the quantities and physical and bacteriological characteristics of the wastes involved; a review of patents, which already indicates that patents now exist on almost every conceivable method of treatment and disposal of the wastes from toilet hoppers; and a classification and course of practical study within the scope of maceration and disinfection.

Developments in Lime-Soda Ash Plants and Equipment—In a final report on its assignment to investigate new developments in lime-soda ash water-softening plants and equipment, which was presented as information, the committee states that the outstanding improvement has been the suspended sludge bed. This process involves the mechanical agitation of the sludge taken from the water during its treatment, by either a motorized agitator or hydraulic means, or a combination of both, for the purpose of suspending the sludge in a layer several feet in thickness and using this as a treating agent by passing the water which is being treated through it. This principle has long been used in the chemical laboratory, where fine solid material is added to solutions to hasten precipitation and to produce a coarse rapid settling or easily filterable floc.

Some advantages attributed to this process are the acceleration of the chemical reaction, which permits shorter retention time and smaller settling tanks; more complete chemical reaction, resulting in decreased sludge carryover and in a softer effluent; and reduction in the quantity of chemicals required to produce a given degree of softening. A less commonly recognized advantage of the process is the ability of the active sludge bed to trap, either by adsorption or absorption, certain organic materials to a degree sufficient to make the method of interest, where it is necessary to treat sewage-polluted water for boiler feed.

Cathodic Protection vs. Painting—A

* *Engineer Water Service (retired), Northern Pacific.*

progress report, offered as information, was presented by the committee on its assignment to investigate the relative effectiveness of cathodic protection and painting in preventing the corrosion of the interiors of steel tanks. The report opens with the statement that underwater corrosion of steel is based on the generally accepted electrochemical theory that the metal dissolves, first forming ferrous hydroxide, and then, with further oxidation from the dissolved oxygen contained in the water, builds up a wall of iron rust around the pitted area. In this reaction, the steel is the anode, or positive pole, and the rust is the cathodic or negative pole. Cathodic protection reverses the process, by involving the principle of the electric cell, so that the steel tank serves as the cathodic pole, while anodes are provided and suspended in the water contained in the tank.

Experience with different classes of paints indicates protection for only one to four years, the committee reported, and periodic painting is essential if maximum results are to be realized. Before paint is applied, it said, the metal surface requires thorough cleaning, and the cost of both this and the painting runs into thousands of dollars per unit over an extended period. Furthermore, it pointed out, the tank is out of service periodically. Equipment for cathodic protection, on the other hand, it said, can usually be installed at a cost equivalent to that of one painting, including cleaning. Moreover, the equipment can generally be installed without taking the tank out of service. However, the report points out that cathodic protection gives protection only to under-water surfaces and that painting of the inside of the roof, and of the side walls above mean water level, is required.

The committee then described in some detail cathodic-protection equipment and its installation, and in conclusion stated that cathodic protection has given more effective corrosion protection than paints applied to date, and has the added advantage that the tank does not have to be taken out of service.

Plastic Pipe and Fittings—The committee presented as information a final report on its assignment to investigate plastic pipe and fittings, developed during the war as a substitute in the pipe and tubing field to conserve critical metals, for small water lines, conveyors of chemical solution, etc. In general, it said, plastics are synthetic resins of high molecular weight, polymerized from simple compounds by means of heat, pressure and catalysis. Tubing of unlimited length is formed by dry extrusion, while standard plastic pipe is produced by a modified extrusion process, in 10-ft. lengths with plain ends, although the ends can be threaded. According to the report, plastic tubing is flexible, yellowish in color, translucent, available in outside diameters ranging from ⅛ in. to ¾ in., and possesses excellent electrical and thermal properties. Standard plastic pipe is available in the iron pipe sizes ranging from ½ in. through 4 in., and is of opaque black plastic. Plastic fittings for the tubing are of the flared union type, with connections threaded for standard pipe thread, and the fittings for the pipe are available in threaded elbows, tees, couplings, caps, plugs, companion flanges and reducing couplings.

Plastic tubing and pipe have a tensile strength ranging from 4,000 to 8,000 lb. per sq. in. and will withstand hot water temperatures of 170 deg. F. continuously, and up to 212 deg. F. intermittently. The material will not support combustion and is rated as self-extinguishing, yet it melts near 310 deg. F. The piping is hydraulically smooth and by virtue of its elasticity, water-hammer pressures are only ½ to ⅛ as great as in iron pipe. Its heat conductivity is only $\frac{1}{4500}$ that of copper. While the committee saw in these new products no serious displacement in the use of metals for water pipe, it pointed out that obvious advantages peculiar to plastic pipe, in counteracting corrosion trouble and in the handling of chemical solutions, should not be negated.

Water for Diesel Locomotives—In a progress report on its asignment on new developments in water conditioning for Diesel locomotive radiators and flash boilers, submitted as information, the committee reported that the problem of corrosion prevention throughout the entire cooling system becomes quite complex because of the number of different metals encountered. The report includes information on a number of tests conducted using various waters and corrosion inhibitors, and states that the use of nitrates should be investigated. It also advances recommendations for the prevention of corrosion, scale and sludge in Diesel locomotive cooling systems. In discussing waters used with the Clarkson-type steam generators, the report mentions the chief sources of coil failures, and the methods used to overcome such failures, and describes some of the tests now underway by a few railroads for suitable water conditioning.

The entire report was received without discussion.

Highways

A. P. BUTTON, Chairman*

The committee presented reports on two of its six assignments, one, a progress report on grade crossing protection, submitted as information, and the other, a final report on barriers for dead-end streets, which was presented for adoption and inclusion in the Manual.

Grade Crossing Protection—Collaborating with the Signal section, A. A. R., and the Highway Research Board, the committee submitted a progress report as information on its assignment to investigate the comparative merits of various types of grade crossing protection. It reported that it had made a further inspection of reflectorized signs installed for test purposes in previous years and again submitted a report on their condition. In conclusion, the committee recommended that the test be discontinued and that consideration be given to different types of automatic and manual crossing protection.

Barriers for Dead-End Streets—The committee submitted a final report on its assignment to prepare plans of barriers for dead-end streets and presented three such plans, with specifications, for barriers constructed of rails, wood, and concrete. It also presented a plan for a barrier warning sign, with the recommendation that all of the plans be adopted for inclusion in the Manual.

The plans were adopted, with an amendment note to the plan covering the concrete wall barrier to the effect that the foundation should be carried lower where the soil or other conditions require.

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Waterways and Harbors

BENJAMIN ELKIND, Chairman*

This committee submitted reports on four of its seven assignments, two of which are progress reports, and two final reports presented as information.

Revision of Manual—Under this assignment, the committee reviewed the terms defined in the Glossary of the Manual that were credited to it and recommended that 16 words with their definitions be deleted. This recommendation was adopted.

Underwater Casings—With reference to its assignment to study metal and other protective casings for pier structures under water, the committee submitted a progress report, as information, which outlines briefly the reasons for applying jackets of metal, concrete, etc., to pile foundations of pier structures, then discusses the types of jackets that have had service application, or test, for the prevention of attack by marine borers. The types of protection discussed include concrete jackets cast in place, precast concrete jackets, sheet aluminum jackets with the space between the casing and pile filled with sand-asphalt, the entire pier structure enclosed within a copper-bearing steel bulkhead, and copper wire spirally wound around the pile. At some later date the committee proposes to present a report concerning jackets applied for the prevention of damage by abrasion.

Inland Waterway Clearances—Covering its assignment on recommended minimum clearance on inland waterways, particularly on large canals, the committee submitted a final report as information, with a recommendation for reapproval of the material now in the Manual. No change was recommended for the reasons that the subject has been given careful consideration not only by subcommittees of the A. R. E. A., but also by the American Society of Civil Engineers, the Western Society of Engineers and the Association of American Railroads, each of which has adopted a resolution practically identical with that now shown in the Manual. The committee's recommendation was approved.

Closures in Flood Control Levees—With reference to its assignment to report

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on methods of constructing closures in flood control levees crossing railroads, the committee submitted a final report as information. Although the responsibility of flood control has been vested with the Army engineers, the report describes three general types of barricades in the interest of promoting uniformity in design. The three types include sandbag barricades for shallow openings, stoplog barricades for openings ranging from 5 to 10 ft. in height, and gated structures for openings higher than 18 ft. This report was supplemented by diagramatic drawings of the stop-log barricade, center support and brace, and a storage building for bags, roofing paper, nails, and other necessary material.

The entire report of this committee was received without discussion.

Yards and Terminals

C. F. HAND, Chairman*

This committee submitted reports on five of its nine assignments, including revision of the Manual, two progress reports and two final reports.

Revision of Manual—Under this assignment the committee reviewed the terms and definitions in the Glossary that it had originated, and made a number of recommendations for their revision. It also recommended incorporating a revised section in the Manual on Locomotive Terminals, to cover that part of Chapter 23, (for which there is now no standing committee) assigned to the Yards and Terminals committee. All the committee's recommendations under Revision of Manual were approved.

Railway Scales—The committee submitted a proposed revision of Section 55 of Chapter 14 of the Manual on scales used in railway service. The material in the revised section again follows that adopted by the National Conference on Weights and Measures, and includes definitions of the various sizes and types of scales, the tolerances applicable to each, the sensitivity reciprocal requirements, and regulations relative to their use and maintenance. The revised section was adopted.

Pertinent Subjects Bibliography—The annual bibliography on subjects pertaining to yards and terminals appearing in current periodicals was presented as information in a progress report by the committee. The references include items having general bearing on this subject, as well as features of special interest, such as the new Burlington classification yard at Galesburg, Ill., the coordination of railway and highway transport in England and Ireland, and the development of communication systems.

Longer Locomotive Runs—A final report was presented by the committee as information on the effect of lengthening of locomotive runs on the location and arrangement of locomotive servicing facilities. The report discusses the trend in increasing the length of locomotive runs and of divisions, and concludes, on the basis of information developed by questionnaires to Class I roads, and presented in tabular form, that the lengthening of locomotive runs has had little direct effect on the location of locomotive servicing facilities, but has resulted in the rearrangement of facilities at some locations.

Servicing Streamlined Trains—On its assignment to study facilities for servicing streamlined trains in coach yards, the committee submitted a final report as information, which includes recommendations for the revision of the Coach Yards section of the Manual.

The report, prepared from information gathered from a study of 10 coach yards, discusses desirable track centers, platforms, supply lines, inspection pits and other servicing facilities, and suggests certain recommended features which should be considered for coach yards servicing streamlined trains. The material submitted for revision of the Manual, while including much of the old text, incorporates the new features recommended in the report. The revisions were adopted.

The entire report of this committee was received without comment.

* *Assistant to Chief Engineer, New York, New Haven & Hartford.*

Uniform General Contract Forms

W. R. SWATOSH, Chairman*

The committee submitted progress reports on its three assignments, including revision of the Manual, all as information.

Revision of Manual—Under this assignment the committee recommended the elimination of the Form of Proposal from the Manual, and also the substitution of a revised Form of Construction Contract and a revised Form of Cost—Plus Percentage Construction Contract to replace the present forms in the Manual. The revised forms are designed to conform more closely to present laws affecting terms of employment, and also to comply with current insurance requirements. All recommendations were approved.

Advertising Sign Agreements—With reference to its assignment to prepare a form of agreement for advertising signs on railway property, including signs in coaches, the committee stated that, in its judgment, the material now in the Manual relating to commercial signs on railway property should not be revised to include individual advertising in railway coaches. Therefore, a separate form of agreement was presented as a progress report covering signs in railway coaches only.

Minor Construction Contracts—The committee presented a progress report as information on its third assignment to prepare a form of construction contract for minor projects. The form submitted is a short form of contract, which the committee believes will, with slight alterations to cover special conditions, fulfill the necessary requirements.

* *Assistant Engineer, Erie.*

Labor Economics

J. S. McBRIDE, Chairman*

Four of its seven assignments, relating to the analysis and study of factors affecting maintenance-of-way practices and the amount of labor employed, were reported upon in detail by this committee. These include revision of the Manual; a progress report on the analysis of operations of off-track equipment in the reduction of labor, which is confined exclusively to a study of conditions of the Denver & Rio Grande Western; a final report on the economies to be effected by intensive supervision of gangs; and a final report on the economies to be derived by roadbed stabilization.

Revision of Manual—Under this assignment the committee recommended the deletion of the seventh paragraph under Employees on page 22-2, dealing with employee representation with management to stabilize labor and reduce the problem of obtaining new employees, and the revision of the second paragraph under Mechanical Equipment relative to the economy of on- and off-track roadway machines, on page 22-3. These recommendations were approved.

Reduction of Labor Required—A progress report, presented as information, was submitted by the committee on its assignment to make an analysis of operations of railways that have made marked progress in the reduction of labor required in maintenance-of-way work. This subject has been a regular assignment of this committee for many years, and for the basis of its current report the Denver & Rio Grande Western was selected. The report lists the many pieces of off-track equipment owned by this road and describes the manifold uses to which they are assigned. Some of these uses are: restoring and strengthening roadway embankments; ditching and cut widening; channel changes and cleaning, both on and off the right of way; embankment construction and cut excavation in connection with line changes; slide cleaning and washout filling; filling bridge openings; snow removal; assisting at derailments; cleaning track and general clean-up work; general material handling; and laying rail with crawler cranes.

Gang Supervision—In a brief final report on the economies to be effected by more intensive supervision of gangs by supervisory officers, the committee presented a list of definite benefits attributable to more frequent inspections of track, bridge and building, and signal gangs. In conclusion, the committee recommended that more intensive supervision be given to these gangs which, it says, will insure that sufficient work is being produced in a safe manner, and in accordance with prevailing standards.

Roadbed Stabilization Economies—After investigating the results of roadbed stabilization by grouting methods on five railroads that have been leaders in this work, the committee presented, as information, a final report on this subject. The report cites typical examples, not only of

* *Chief Engineer, Chicago & Eastern Illinois.*

the labor savings derived from the elimination of soft spots in the track by pressure grouting, but also of the improvements made by the removal of slow orders and the speeding up of train operation. It concludes with the statement that the studies made to date of pressure grouting clearly indicate substantial savings in track maintenance, which often absorb stabilization costs in from one to three years' time.

The committee's entire report was received without discussion.

Work Equipment

EDGAR BENNETT, Chairman*

Final reports were submitted by this committee on railway-owned automotive equipment, concrete handling equipment, power jacks, and a handbook of instructions for the care and operation of maintenance-of-way equipment. Also, progress reports were presented on revision of the Manual; the standardization of parts and accessories for railway maintenance motor cars, portable conveyors, snow-removal equipment, and machinery and equipment for stabilizing roadbed.

Revision of Manual—The committee recommended changes in the Glossary, including the deletion of 65 words and terms, and a revision in the definition of a rail saw. Under this same assignment, the committee recommended a change in the text covering gasoline tanks—under the subject of Standardization of Parts and Accessories for Railway Maintenance Motor Cars—to include welded tanks, and also recommended that the material now shown under the subject, Methods of Maintaining Motor Cars, be reapproved without change. These recommendations were approved.

Standardization of Motor Car Parts—Giving consideration to the establishment of certain tolerances and specifications for bolted, demountable plate wheels for motor cars, the committee submitted a progress report on this phase of an assignment to investigate the standardization of parts and accessories for railway maintenance motor cars. It presented specifications for maximum tolerances of eccentricity, and for the metal to be used in the manufacture of motor car wheels, with the recommendation that these be included in the Manual with Fig. 2710. This recommendation was adopted.

Handbook on M. O. W. Equipment—For its assignment to prepare a handbook of instructions for the care and operation of maintenance-of-way equipment, the committee submitted a final report with the recommendation that, if adopted, the material be printed in handbook form as a supplement to the Manual. The report contains general instructions relative to safety, lubrication, loading and blocking, and also specific instructions for the care and operation of gasoline engines and their appliances, of Diesel engines, of 28 self-contained machines now in general use, and of 14 auxiliary tools and appliances. An eight-page index is appended for reference purposes. The committee's recommendation was approved.

Portable Conveyors—In a relatively brief progress report, presented as information, the committee stated that it found that the two types of portable conveyors, powered by gas engines or electric motors, which are generally used in maintenance-of-way work, are the belt-type car unloaders and the troughed belt conveyors. The first type mentioned, it said, is designed especially for unloading bulk material from hopper cars and is used with feeders on top of rails or in shallow pits. The second type mentioned, according to the report, is known as the general-purpose conveyor, and is designed for use in handling brick, material in bags, small boxes and loose parts. The report includes tables indicating the cost of operation and maintenance of two sand conveyors used for loading engine sand, and also descriptions of the machines.

Snow-Removal Equipment—A progress report by this committee includes a detailed discussion of the use of eight types of snow-handling machines. The on-track machines discussed include the snow-loader and melting tank outfit, weed burners, railroad push plows, and the spreader-ditcher, while the off-track units include tractor snow plows, the tractor bulldozer with plow and wings, and overhead loaders. Two other units discussed in the report are the truck-mounted snow-blower and the conveyor snow-loader—machines that can be adapted to both on and off-track use. In addition to general descriptions of the machines, the discussion covers the general application made and the amount of snow that can be handled by each.

Automotive Equipment—Supplementing a report made in 1939, the committee this year submitted a final report, as information, on railroad-owned automotive equipment. The report states that there is a trend toward the ownership of more of this equipment, not only in regions where the competition for labor is great, but also in lightly populated areas. Many trucks, it states, are used in busy terminal areas, and many others are being designed with special bodies and fitted with special tools and equipment for repairing work equipment on the line of the road.

Concrete Handling Equipment—After pointing out that this assignment covers a broad field of equipment ranging from shovels and wheelbarrows to large towers, elevators, chutes, etc., the selection and use of which are determined largely by the volume of concrete to be handled and the type of structures and topography of the surrounding ground, the committee, in a final report, describes the uses of several machines which are generally employed for this class of work. These descriptions cover paving mixers, truck mixers, elevators, concrete buggies, concrete mixers, portable hoppers, cableways, Pumocrete outfits, and concrete-handling buckets.

Power Jacks—A final report, as information, was presented by the committee on this subject. The report describes the machine and its operation, mentions how it is used to best advantage, and states that the power jack is considered both practical and efficient for the purposes for which it is intended.

Roadbed Stabilizing Equipment—In a progress report, presented as information, on its study of machinery and equipment for stabilizing roadbed, the committee first directed attention to a progress report presented last year by the Roadway and Ballast committee on Roadbed Stabilization. In this year's report, the committee describes the two methods used for the application of grout and the types and mountings of the machines in general use. Then, after stressing the importance of handling materials efficiently, it lists the various machines and accessories that are essential for a typical grouting operation of comparatively small size.

The entire report was received without discussion.

Wood Preservation

C. S. BURT, Chairman*

Although consideration was given to all of its 11 assignments, this committee submitted progress reports on only two, these including corrections to be made in the report of last year on the destruction of termites and possible ways of prevention, and a report on the investigation of incising forest products, both of which were presented as information.

Prevention of Termite Destruction—This year's report on this subject dealt with corrections to be made in the report presented by the committee last year, these corrections including changes in the material in the copper naphthenate treatment, revisions in some of the tables, and changes in some of the conclusions.

H. S. Loeffler (G. N.) noting that the report deals primarily with the prevention of termite destruction in new construction, expressed the thought that studies of the committee should be extended to include protection for existing structures located in termite territory. Chairman Burt replied that this suggestion would be given consideration in the future work of the committee.

Incising Forest Products—During the past year the committee made an investigation to determine the effect of incising, in accordance with A. R. E. A. specifications, on the penetration into white fir, eastern spruce and yellow birch crossties, and presented a progress report as information on this study. The report states that each tie treated was incised for half of its length and, after treatment, two sections were taken from each half and examined. Examination of the sections, it says, shows that no improvement is obtained in these species of wood by incising.

Although formal reports were not submitted on assignments relative to the re-

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* *Manager Forest Products Bureau, Illinois Central System.*

The committee recommended minor revisions in five other plans, all concerning manganese insert crossings, with the exception of one, which referred to the changing of a dimension of an insulated gage plate. It also recommended the revision of the text under Appendix A, Portfolio of Trackwork Plans, relative to the fit of bolts.

As part of the same assignment, the committee presented a progress report on stress measurements on various designs of solid manganese crossing frogs. From the facts developed in tests on crossings reported on last year, the Taylor-Wharton Iron & Steel Co. designed and produced a crossing frog with increased girder strength across the flangeways, which was installed in place of one of the crossings under test at the B. & O. C. T. crossing at McCook, Ill. The report states that the new frog has effected a measurable, though limited, reduction in the flangeway stresses and may be expected to give good service performance. Other test frogs were installed and the report comments on the development of small flangeway cracks in them, supplementing its remarks with diagrams.

To lower the flexural stresses in the flangeways, a steel T-section type of frog support was designed and applied under a new crossing of the solid manganese type (about 90 deg.) in the crossing of the Indiana Harbor Belt and the Chicago & Western Indiana near 55th street and Cicero avenue in Chicago. Eight wire resistance gages were applied at critical or significant stress locations on the T-section and on the solid manganese crossing frog, and measurements were begun the second day after the installation was completed. From measurements taken at this experimental installation, several conclusions were reached, among which were the verification of the method of calculating stresses in the T-section, and that this type of support is effective in lowering flangeway stresses.

All of the recommendations of the committee with respect to new and revised plans were approved, but in the discussion which followed presentation of the report E. M. Hastings (R. F. & P.) raised the question as to why the railroads could not secure A.R.E.A. standard manganese guard rails with the 55 ½-in. guarding face. In reply, a representative of the railway trackwork manufacturers pointed out the difficulties involved in producing guard rails of this length and also mentioned that the price of such rails would be prohibitive.

Stresses in Tie Plates—Collaborating with the Committee on Ties and on Rail, this committee presented a progress report, as information, on the simplification of tie plate design. The report traces the history of this effort, which received its greatest impetus during the war, to reduce the number of sections, and which, at the beginning of the investigation, totaled 310 different sections from 18 in. to, but not including, 8 in. in length, and with 653 different punchings for plates down to and including the 10½-in. tie plate. From various meetings with the Special Committee on simplification and Standardization of Tie Plates of the American Iron and Steel Institute, 15 tie plate designs have evolved. Drawings of the 15 designs were included in the report which the committee submitted, with the statement that notice had been received from the manufacturers that plates of any of these 15 designs will be furnished at base prices, and that plates deviating in any way from these designs will be subject to extra charges. The report closes with the statement that the committee is of the opinion that the simplification of practice with respect to tie plate sections is greatly to be desired, and also that it is neither practical nor desirable to establish fixed dimensions for the punchings.

In presenting this report, Major J. de N. Macomb (Inland Steel Company) stated that since the publication of the subcommittee's report, an additional tie plate size has been added to those that will be manufactured at base price. In a prolonged discussion which followed the presentation of the report, there appeared to be some dissatisfaction with the restrictions imposed by the 16 plate designs proposed and the inference that designs were being established by the manufacturers rather than the A.R.E.A.. Replying for the manufacturers Major Macomb and E. W. Backes (Carnegie-Illinois Steel Corporation) pointed out that the proposed designs had been agreed upon through joint collaboration of the manufacturers and track committee, and that their selection at this time would not restrict progress in plate design in the future.

Welding Manganese Castings—In a final report on its assignment to study the welding of manganese castings in special trackwork, collaborating with the Committee on Maintenance of Way Work Equipment, the committee described the condition of the test welds on turnout frogs on the Toledo Terminal Railroad and presented its observations. The report lists nine general conclusions arrived at after the several years of tests both in the laboratory and the field, as follows: Cracked, laminated or defective metal should be removed by grinding before applying the welding material; the most desirable welding current for the 5/16-in. diameter bare rod is greater than 100 amp.; although the effect of the composition of the welding rod was not clearly defined in field tests, metallurgical examination of laboratory test specimens showed greater freedom from cracks and a better weld structure with the copper-molybdenum-manganese rod; removal of work-hardened surface by deep grinding before welding did not give noticeable benefit; the results from coated rods were indeterminate; good or fair welds were obtained in the field tests in some cases without peening, while laboratory tests showed definite benefits; although the weld applied on a flame-cut surface without grinding in the Mannheim field test gave good performance, a laboratory study indicated that this practice was detrimental to the metal surface; good welds can be obtained in cold weather; and the skill of the welder in minimizing shrinkage cracks, blow holes, or inclusions, may be expected to be an important factor in securing a long weld life.

Joint Lubrication—In its first progress report of laboratory tests, begun in 1937, for the prevention of frozen joints by rail joint lubrication, the committee described the rail joint slippage machine designed by the A. A. R. research staff (built by the Burlington and installed in its testing laboratory at Aurora, Ill.), to open and close the rail gap once a minute. The purpose of this machine was to study rail joint lubrication by producing wear on the joint bars and rail due only to slippage action, and to develop information on the most promising types of lubricants. Lubricants tested included Petrolatum, both the highly refined and the commercial grades, No-Ox-Id "A" Special, Texaco No. 904, Texaco Rust Proof "L," Texaco No. 45, Crater 1-X Compound, R. M. C. plastic joint packing, Leadolene No. 385, and Meropa No. 8. Several tests with each lubricant were made using both new and laboratory-worn head-contact and headfree 112-lb. A. R. E. A. 4-hole bars, and comparable tests were made using similar bars without any lubricant.

Summarizing, the report states in part that lubrication of a new rail joint was beneficial for about 500 cycles of opening and closing of the rail gap, and that, after regreasing, the benefits extended over a larger number of cycles; that there was no advantage in flame cleaning joint bars and rail ends unless a lubricant was used; that headfree joints require much smaller slippage forces to open and close the rail gap than head-contact joints; and that hand oiling a laboratory-worn head-contact joint without removing the joint bars was beneficial for about 200 cycles. Among the conclusions, the report states that the laboratory tests, which were made in the absence of wheel loads and weather, do not justify a commitment as to the types of lubricants or preservatives that should be most effective in minimizing rail joint wear and the occurrence of frozen joints in track.

The report on the second part of this assignment covers service tests of joints in the track, applied with and without lubricants, on a test section consisting of five miles of track laid with 131-lb. RE rail, 6-hole joints and slag ballast, on the westward main track of the Burlington between Leland, Ill., and Earlville, described in a report made last year. The current report describes the data taken by the research committee, and then comments as follows:

"Joint gap measurements failed to show any significant difference in the performance as to variation of joint gap widths between the various types of lubricants used or, whether any lubricant was used. The joint bar pull-in measurements showed some variation with individual lubricants but, inasmuch as the pull-in for this first year of service is largely the result of wearing away the mill scale, the report attributes little importance to these differences at this time. While the bolt tension data are not intended to reflect the merits of lubrication, they do show that the tension applied in 1945 (ranging from 20,000 to 22,300 lb. on the headfree joints and from 17,600 to 21,400 lb. on the head-contact joints) was insufficient to maintain all bolts above a tension of 5,000 lb., indicating that an average of 20,000-lb. bolt tension for the first year's life of new rail is

among college and university students a greater interest in the science of transportation and its importance in the national economic structure, by cooperating with and contributing to the activities of student organizations in colleges and universities. The committee stated that plans are underway to have representatives from railroads address undergraduates at colleges and universities, supplementing their addresses with moving pictures showing railroad operation, construction and maintenance programs.

Cooperative Education—A report last year on this subject dealt with the railroad officer's point of view concerning the cooperative system of education for railroad service. This year, the committee presented a report on another phase of this subject—the fundamental objectives of the colleges that specialize in cooperative education. The report is based on information selected from a report by a committee of the American Society for Engineering Education, and outlines the requirements and aims of a cooperative college, the part that actual employment experience plays in the student's educational program, and the advantages both to the student and to the employer of cooperative education. In most of the cooperative colleges, it says, the student spends equal periods of time in school and in industry—the position being filled by two students alternating, which provides continuous service on one job.

Investigate Textbooks—On its assignment to investigate textbooks and other material available for instruction in railway engineering, and make pertinent recommendation thereon, the committee presented a progress report. From a survey made by this committee of the engineering courses currently offered in transportation by more than 90 engineering schools throughout the country, it found that the colleges with such courses fall into five groups: (a) those (18 in number) that require courses in transportation, transportation engineering and highway engineering combined, (b) those (10 in number) that offer elective courses in transportation, transportation engineering, or railway and highway engineering combined, (c) those (10 in number) that require courses in railway engineering, (d) those (11 in number) that offer elective courses in railway engineering, and (e) those (41 in number) that do not offer any courses in transportation engineering or railway engineering beyond route surveying.

Records and Accounts

F. B. BALDWIN, Chairman*

Four assignments were reported on by this committee, of a total of seven. The subjects on which reports were presented included revision of the Manual, a bibliography, the relation of construction reports and property records to current problems, and the study of valuation and depreciation accounting.

Revision of Manual—In addition to a recommendation for deleting 36 words and their definitions, revising the definitions of 29 other words, and adding two more words and definitions to the Glossary, the committee recommended the adoption of revisions to portions of five other pages in the Manual, dealing with the proper handling of records and accounts, that were originated by this committee. All of the recommendations were adopted.

Bibliography—Continuing its practice of previous years, the committee presented a bibliographical review of books, articles and pamphlets appearing from November, 1945, to November, 1946, inclusive, dealing with subjects in which it is interested.

Construction Reports—The committee presented a progress report, as information, on the relation of construction reports and property records to current problems. The report was framed to clarify some of the more important uses made of these records. One of the most significant of the uses, it points out, is with accounting for the cost of a railway acquired by purchase, merger, reorganization, or otherwise, to conform with the order issued June 16, 1941, by the Interstate Commerce Commission, which requires a radical departure from the accounting practices that have been in effect for 40 years or more. The construction reports and property records are used also, it states, with depreciation accounting, which became so important beginning January 1, 1943, and still more so on January 1, 1945, because of I. C. C. orders relating to accounting that went into effect on these dates. Although a set of records is required for reports to the Bureau of Internal Revenue, separate from those used for depreciation accounting, the committee report points out that the construction reports and property records are used for this purpose also, as well as for court hearings on bankruptcy; trusteeship or reorganizations; finance hearings; taxation purposes; rate cases; contractural relations between railroads; making retirements from accounts; estimating cost of new work; determining amount of fire insurance to be carried; and in establishing cost of fire losses.

Valuation and Depreciation—This assignment was broken down into three parts: (a) current developments in connection with regulatory bodies and courts; (b) I. C. C. valuation orders and reports; and (c) development of depreciation data. The progress report presented by the committee at this time, as information, covered only parts (a) and (c). For part (a), the report makes known the progress of the activities of the Bureau of Valuation of the I. C. C., and states that, in a report of June 20, 1946, the I. C. C. found the approximate aggregate value for rate-making purposes of the properties of Class I railroads to be $19,571,000,000 while the carriers gave testimony at a hearing held July 23, 1946, that a figure of approximately $22,164,000,000 would be reached if proper consideration was given to the increase in price levels since 1937.

Under part (c), the report gives consideration to a 118-page booklet entitled, "Depreciation Studies on Certain Items of Depreciable Roadway Property and Equipment for Application to Group Properties," issued on January 1, 1946, by the Engineering section of the Bureau of Valuation, I. C. C., and points out defects and discrepancies contained therein. The report also reproduces some of the tables used in the booklet to substantiate its criticisms.

Clearances

J. E. SOUTH, Chairman*

A report dealing exclusively with revision of the Manual, one of its three assignments, was presented by this committee. Of the 10 clearance diagram figures now appearing in the Manual, the committee submitted nine for reapproval, the one omitted being Figure 8 covering clearances for high platforms serving refrigerator cars.

Track

I. H. SCHRAM, Chairman†

Reporting in detail upon 9 of its 12 assignments, the committee covered a wide range of subjects dealing with track materials and maintenance practices.

Revision of Manual—Following a review of the material in the Manual which it had initiated, the committee recommended the revision of some definitions in the Glossary, a few other minor changes, and the complete revision of the material now appearing under the subject of Spirals. The recommended revisions were adopted.

Switches, Frogs, Crossings, Etc.—Under its assignment to study plans for switches, frogs, crossings, spring and slip switches, collaborating with the Signal section, A. A. R., the committee gave primary consideration to manganese steel frogs and crossings, both the insert and rail-bound types, and prepared the following plans, which it recommended for adoption:

Plan 621—Data and Sections for Rail-Bound Manganese Steel Frogs for Rails 112 lb. and Heavier.

Plan 622—Nos. 6, 7 and 8 Rail-Bound Manganese Steel Frogs for Rails 112 lb. and Heavier.

Plan 623—Nos. 9, 10 and 11 Rail-Bound Manganese Steel Frogs for Rails 112 lb. and Heavier.

Plan 624—Nos. 12, 14 and 15 Rail-Bound Manganese Steel Frogs for Rails 112 lb. and Heavier.

Plan 625—Nos. 16, 18 and 20 Rail-Bound Manganese Steel Frogs for Rails 112 lb. and Heavier.

Plan 750—Designs and Dimensions of Manganese Steel Inserts for Crossings of Angles from 14 deg. 15 min. to 45 deg. for Rails 6 in. and More in Height.

Plan 782—Articulated Manganese Steel Crossings, Angles 90 deg. to 60 deg., Incl.

Plan 783—Articulated Manganese Steel Crossings, Angles Below 60 deg. to 40 deg., Incl.

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* *Engineer Bridges & Buildings, Pennsylvania.*
† *Chief Engineer, Erie.*

fatigue strength of such specimens varied from 35 to 50 per cent of the fatigue strength of the original eyebar.

The report explains the procedure of flame shortening in detail, with descriptions of the equipment and tools required to carry out the work, and the manner of determining the stress in the eyebars with strain gages, before and after shortening. Among its conclusions, the report states that the flame-shortening method for eyebars not only eliminates costly train delays, because one hour is all that is required to treat one eyebar, but also that the equipment necessary for accomplishing the reduction in length is standard for bridge and building gangs, with the exception of the clamps and a pyrometer.

Buildings

H. C. LORENZ, Chairman*

This committee submitted one progress report and two final reports, as information, of its eight assignments.

Revision of Manual—The committee separated this assignment into two parts: one covering the revision of the material now appearing under Buildings in the Manual and the other covering pertinent material to be transferred from Chapter 23, for which subject there is now no standing committee, to the Buildings section. The revision recommended for adoption in the first part of this assignment includes matter pertaining to excavation, filling and backfilling; sewers and drainage; plumbing; built-up roofing; and parking facilities and signs for passenger stations. All recommended revisions were approved.

New Building Materials—On its assignment relating to the use of recently developed building materials in railway buildings, the committee presented a progress report as information. Stating that many new building materials have been introduced in recent years, while others have become so common as to no longer seem new, the committee pointed out that the ten materials covered in its report are not in general use in the railroad industry. The information presented covers the physical and mechanical properties of the materials, as well as outlines their uses as related to railroad facilities. The ten products described include corrugated glass, glass blocks, insulating glass units, silicone resin paints, enameled steel tile, vinyl resin floor tile, structural aluminum, precast concrete shapes, and cement-base paints.

Shop Building Ventilation—A final report, presented as information, on ventilation of railway shop buildings, particularly for Diesel locomotives, discusses the types of ventilation best adapted to blacksmith shops; boiler houses; carpenter shops; washer, locker and toilet buildings; Diesel engine repair shops (both the light-repair and heavy-repair sections); cleaning rooms; battery rooms; laundries; machine and erecting shops; paint shops; roundhouses and shop offices. A drawing accompanies the report to give "a complete picture of the present philosophy for better ventilation of shop buildings, including the elimination of monitor construction, and especially of top-hung sash." For best results as to capacity and all-around utility, the report states that the total height of the roof ventilator should be not less than 1.8 times the diameter of the stack, the width should be two times the diameter, and the exhaust area should be not less than three times the ventilator stack area.

* *Assistant Engineer, Cleveland, Cincinnati, Chicago & St. Louis.*

Impact

C. H. SANDBERG, Chairman*

Progress reports were presented as information by this committee on five of its nine assignments, each briefly discussing tests carried out during the last year. In reporting on four of its assignments, covering tests of viaduct columns, steel girder spans with open and ballasted decks, dynamic shear in steel girder and truss spans, and rigid-frame structures of steel and concrete, the committee told of its preliminary and exploratory work, the structures and members on which the tests were made, and stated that progress is being made on the analysis of the data. The committee stated that a final report has been prepared on the determination of the damping factors of steel spans and the variation in amount of damping with change in loading, by means of tests with an oscillator and model tests, but said that publication of the report is being deferred until the June-July, 1947, bulletin.

Cooperation with Universities

F. R. LAYNG, Chairman†

After prefacing its report with a foreword stating that it is the belief of the committee that the railroads, as a whole, are not taking adequate steps to protect their interests in that they are not establishing definite recruiting plans to secure college-trained men, and further, that studies show that on many railroads the average age of their engineer employees is much higher than is desirable, this committee submitted, as information progress reports on all of its four assignments.

Appreciation of University Training—One of the assignments of this committee is to stimulate greater appreciation on the part of railway managements of (a) the importance of bringing into service selected graduates of colleges and universities, and (b) the necessity for providing adequate means for recruiting such graduates and of retaining them in the service by establishing suitable programs for training and advancement. In some detail, the report discusses the success and failure of past employment practices, the need for better selection of supervisory personnel, the availability of properly trained replacements for key men, an employment plan, and a training and development plan. To illustrate its contention that adequate compensation must be offered by the railroads to attract graduates, the report presents information relative to the average salaries being paid to inexperienced and experienced employee graduates in manufacturing, utility, and railroad companies. The report endorses a plan that will afford opportunities to engineer graduates for eventually attaining managerial positions on the railroads.

E. M. Hastings, (R.F. & P.), speaking, not as a member of the committee or a past-president of the association, but as a member of the Engineers' Joint Council, which is composed of the past and present officers of the various engineering societies, advised of the studies being made by that council of the employment of engineering graduates, and reported that he had given the council a brief of the committee's report to assist it in its work.

He regretted to have to report that one of the council's studies indicates that the rail transportation systems of the country as a whole were employing fewer graduate engineers in proportion to their total employees than almost any other industrial group. In this regard, he said, studies showed that the railroads were classed in Group "D"—the lowest of the four groups classified—along with such manufacturers as soap makers.

W. C. Sadler, professor of civil engineering, University of Michigan, commented that it is not always true that the best railroaders come from honor societies, but that it is more natural that they come from the average students who are deeply interested in railroading. He thought that the railroads could assure themselves of securing graduate engineers if they would adopt a policy of hiring more undergraduates during the summer months, because he said that it had been his observation that if a man works for a railroad while a sophomore and a junior, the railroad will not have to fight for him as a graduate, regardless of salary.

He also offered the suggestion that since it is often the duty and pleasure of university instructors to advise undergraduates as to whether or not they should accept employment with a railroad, it might be well for the roads to try to sell these instructors on the merits of railroad employment. He thought there could be no better way to accomplish this than to hire a few such instructors during the summer months in any of the many capacities for which they are capable.

H. S. Loeffler (G. N.) suggested that a way to encourage college graduates might be to get rid of some of the obsolete titles now given them, and to offer new titles more commensurate with the type of work they must perform, such as architectural-engineer or structural designer, instead of draftsmen, etc.

Students and Railroad Vocations—A brief report was presented by the committee on its assignment to stimulate

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view of specifications for creosote with particular respect to limitation of residue above 335 deg. C, the development of specifications for the treatment of wood to make it fire-resistant, and the preliminary conditioning of forest products for treatment by artificial methods of seasoning, the chairman of these respective subcommittees reported briefly on the work now underway.

Ties

C. D. TURLEY, Chairman*

Brief progress reports were submitted by the committee on four of its seven assignments. Excluding the report on revision of the Manual, which was presented for adoption, the other reports, all of which were presented as information, cover investigations as to the extent of adherence to A. R. E. A. specifications, substitutes for wood ties, and tie renewals and costs per mile of maintained track.

Revision of Manual—Under this assignment the committee checked the accuracy of all items originated by it and adopted prior to 1930, and in a progress report recommended the reapproval of the material shown under the headings, Installation and Keeping Records of Cross Tie Test Sections, Specifications for Tie Plugs, and Fundamentals to be Considered in Designs of Substitute Ties. Two changes were recommended in the material shown under the heading Marking Ties for Service Records, to insure the more accurate placing of dating nails, and a change was recommended for the use of aluminum instead of zinc tags. Under Conservation of Timber Supply, the report recommends a change in the text to point out more comprehensively how ties can be protected from mechanical wear. All of the recommendations were approved.

Adherence to Specifications—Continuing a practice prevailing before the war, the committee submitted a progress report on its investigation on the adherence to A. R. E. A. specifications, in so far as they relate to ties. The report states that generally satisfactory housekeeping conditions were found in seasoning yards, the only divergence from best practices being in the manufacture of ties, which was not up to pre-war standards, particularly as to tie size.

Substitutes for Wood Ties—Directing attention to a report made on this subject in 1940, the current progress report by this committee states that no additional installations of substitute ties have been reported. Concerning the substitute ties installed prior to 1940, the report shows that, of the 26,962 Brown concrete ties installed in the years 1925, 1927, 1928 and 1930, less than 30 per cent are still in service; of the 1,329,386 Carnegie, unsymmetrical steel I-beam ties installed during the period 1904 to 1923, only about 0.03 per cent are now in service; of the 983 Snyder steel and concrete ties installed in 1906, more than 98 per cent are in service; and of the 149,317 Dalton ties installed during the period 1927 to 1938, almost 99 per cent are still in service. The current high prices of wood ties, the report points out, make the subject of substitute ties a matter worthy of much consideration and study.

Tie Renewal Record—In a progress report regarding the number of tie renewals and costs per mile of maintained track, the committee directed attention to the tabulations of these figures published in a mid-year bulletin. The report attributes the decrease in tie renewals to a shortage of man-power in track maintenance, rather than to a shortage of ties. The rise in the cost of ties, which began in 1941, it said, continued through 1945.

* *Engineer of Ties and Treatment, Illinois Central.*

Masonry

F. R. SMITH, Chairman*

Detailed progress reports were presented as information by this committee on two of its nine assignments; one, dealing with specifications and principles of design of plain and reinforced concrete for use in railway bridges, buildings and culverts; and the other, on progress in the science and art of concrete manufacture.

Concrete Specifications and Design—Collaborating with six other standing committees, the committee submitted a report on this assignment, which was presented in two parts. The first part covers tentative specifications to be substituted for the present material shown in articles 301 to 310, inclusive, in the Manual, and will be submitted again next year for adoption, after they have been amended in accordance with any suggestions made. As presented, this part of the report includes information on the design loads for railway structures supporting tracks; design loads for highway bridges and buildings; a summary of working stresses; and design of reinforced concrete beams; reinforced concrete and composite columns; frames, beams and one-way slabs; two-way slabs with supports on four sides; flat slab construction; and footings. The second part of the report contains completely new specifications for the design of concrete transmission poles, which were presented for comment, with the idea of offering them for adoption at next year's annual meeting to replace the present material now appearing on page 8-75 of the Manual.

Air-Entraining Concrete—Under its assignment to investigate progress in the science and art of concrete manufacture, the committee presented a progress report on air-entraining concrete, which opens with the statement that this subject is the most important development in concrete technology in many years. The report states that the general result of tests, conducted in laboratories and in field experiments, shows marked benefits to be obtained by the use of air-entraining agents. The principle of air-entrainment is then described, along with the materials used to effect these results; the aggregates to be used for best results; and the various effects of air-entrainment on the usual properties of concrete. The advantages and disadvantages of air-entraining cements or admixtures are then discussed, followed by a review of design problems associated with these agents and precautions to be observed in their use. A bibliography of published articles relating to the subject of air-entraining concrete completes this report.

* *Assistant Chief Engineer in Charge of Bridges and Buildings, Union.*

Iron and Steel Structures

E. S. BIRKENWALD, Chairman*

Three of six assignments were reported on by the committee, including revision of the Manual, the relation of fatigue of metals in bridge design, and the development of an efficient and economical method of shortening eyebars to equalize stress.

Revision of Manual—This assignment was reported on in two parts, one, submitting six additional words with definitions for inclusion in the Glossary, and the other, covering 14 additions or deletions to clarify or simplify the existing text. The major revisions were with regard to the specifications for steel castings and the determination of impact.

Fatigue of Metals—In a final report, submitted as information, the committee stated that it was of the opinion that the testing and study of fatigue of metal in structures had been brought to a completion, even though work of the Committee on Fatigue Testing might continue along other lines. The report outlines the purposes for which the sub-committee was created and reviews all of the various reports submitted since 1940 on the various phases of fatigue testing, with references to where the reports can be found in the publications of the association.

Shortening of Eyebars—A detailed progress report was presented on the shortening of eyebars to equalize stress in them, the study of which led to the development of a method to shorten such bars by heating with oxyacetylene torches, which requires less time and less expense than any method used heretofore. The report includes a table showing the variation in live load stresses in eyebar truss members, and other tables showing the results of stress tests made with eyebars which have been shortened by heat treatment, with bars shortened by cutting and splicing with both fillet-welded and riveted joints, and with bars not shortened. According to the report, the results of the tests indicate that the shortening of wrought iron and steel eyebars by upsetting them while they are at a high temperature has no significant effect upon either their static or fatigue strength, whereas comparable tests on representative eyebar specimens shortened by more costly methods showed that the

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not too high." The report closes with the observation that these tests have been of insufficient duration to warrant any conclusions as to the relative performance of the various lubricants.

Placing of Anti-Creepers—A progress report on the three test installations of rail anchors applied in 1944 was presented by the committee on its assignment to study and submit recommendations on the number and placing of anti-creepers for various conditions. Two of the test locations are located on the Milwaukee in gravel ballast territory, one on 131-lb. rail near Mauston, Wis., for one-direction traffic, and the other on 112-lb. rail near Burlington, Wis., for two-way traffic. The third test location is located on the Illinois Central near Kankakee, Ill., in stone ballast territory, on track laid with 112-lb. rail carrying traffic in one direction only.

At the Mauston test location, from rail creepage measurements taken, the committee concluded that two methods have shown superior performance throughout the 33-month test, and with only 8 and 10 anchors, respectively. One of these methods places an anchor against the side of the 4th, 6th, 8th, 10th, 16th, 18th, 20th and 22nd ties from the receiving end of the rail, while the other method is the same except that anchors opposing a back-up movement are placed against the 7th and 17th ties from the receiving end of the rail.

From similar measurements, as well as observation of the tie movements, at the Kankakee test location, the committee concluded that four methods of anchorage continue to show the most satisfactory performance. These four methods involve placing the anchors quite uniformly throughout the length of the rail, with anchors against the same ties on the opposite rail.

Data taken on the test installation of the single track near Burlington show that, in a majority of miles, the north and south rails have moved in opposite directions; that staggered anchoring seems undesirable because of the excessive tie skewing; that an adequate number of anchors should be used to arrest creepage in both directions; and that, to obtain maximum rail restraint with the minimum number of anchors, the anchors should be spaced evenly throughout each half panel.

Reactance Value of Spring Washers—Continuing a study conducted since 1937 on a number of railroads on the reactive properties of spring washers and assembled rail joints, the committee presented a final report reviewing the test procedure and submitting its recommendations. The report points out that the bolt tension should not be permitted to fall below 5,000 lb. for the symmetrical type of joint to function satisfactorily in the track and to avoid accelerated joint wear. To meet the current A. R. E. A. recommendations that bolt tension of 20,000 to 30,000 lb. should be provided in the initial tightening of bolts in new joints, and thereafter that tension of 15,000 to 25,000 lb. should be used, the report states that a spring washer with at least 5,000-lb. reactive spring pressure at the release of 0.030 in. is highly desirable. Also, from the standpoint of track maintenance, a spring washer with a permanent travel of 0.10 to 0.12 in. when released from a load of 20,000 lb. to zero should be satisfactory. The report closes with the statement that if a spring washer having these suggested reactive features could be manufactured at a reasonable cost, it would be a valuable contribution to the maintenance of rail joints.

Speed Through Spring Switches—In a final report on its assignment to investigate the maximum speed through spring switches when points must be thrown by a train moving on the tangent track, collaborating with the Signal section, A. A. R., the committee found that there are very few cases where points are so thrown. Because of differences in the types of construction used, including weight of rail, length of points, reinforcing and bracing, and also on account of the differences in classes of power, the committee expressed the opinion that a maximum speed cannot be fixed and that each road will have to make its own decision.

C. H. Blackman (L. & N.) urged the importance of establishing a maximum permissible speed through spring switches under the conditions set forth in the assignment, but subcommittee chairman C. T. Jackson (C. M. St. P. & P.) repeated the belief of the committee that because of the many factors involved such a maximum speed cannot be fixed.

Hold-Down Fastenings—Collaborating with the Committee on Ties, this committee submitted its first progress report on its study of hold-down fastenings for tie plates and their design, and their use and economy with respect to minimizing tie wear. Two test locations were arranged on the tracks of the Illinois Central. The first covers three miles of a middle main track north of Manteno, Ill., which is laid with 131-lb. RE rail and 6-hole headfree joint bars, and surfaced with a moderately coarse stone ballast. All ties were renewed with 7-in. by 9-in. by 8-ft. 6-in. creosoted pine, gum, and oak ties, laid out-of-face on miles C-43, C-44, and C-45, respectively. The north half of each mile was plated with 7¾-in. by 13-in. by 27/32-in. double-shoulder tie plates, whereas the south half of each mile was plated with Pennsylvania Railroad standard 7½-in. by 14¾-in. by 31/32-in. double-shoulder tie plates. Each half mile of track was divided into seven equal parts with the same number of different arrangements of anchor spikes including: no hold-down spikes; four screw spikes; two screw spikes; four screw spikes with double coil washers; two screw spikes with double coil washers; four cut spikes; and two cut spikes.

The second installation covers a short test piece of main track carrying northward traffic near mile C-45, located about 1½ mi. north of Manteno, which is laid with 112-lb. RE rail. The test track includes 390 new creosoted gum ties plated with Illinois Central standard 7¾-in. by 13-in. by 27/32-in. double-shoulder tie plates. In these ties two elastic spikes per plate were driven in diagonally opposite holes and the free ends of the spikes were positioned parallel with the rail.

The committee reported that initial tie plate penetration readings were taken at both of these installations in August, 1945, and September, 1946, but that since the average penetration measurements were very small, it is too early to draw conclusions.

Waterproofing

C. E. ROBINSON, Chairman*

Of its two assignments, this committee submitted a progress report only on revision of the Manual, recommending the addition of a sentence to the item concerning arches, under the heading of Specific Cases on page 29-14 relating to the Principles Governing the Waterproofing or Dampproofing of Railroad Structures, to point out that special attention should be given to drainage and to the position of the fill to prevent the pocketing of water. This recommendation was adopted.

Wood Bridges

S. F. GREAR, Chairman†

Detailed reports were submitted by this committee on two of its eight assignments, one being a progress report on improved design of timber trestles, which was presented as information, and the other a final report on the preparation of specifications and design of fastenings for timber trestles, including metal joint connectors. Under another assignment to investigate the proper procedure to be followed in renewing creosoted timber ballasted-deck trestles, the committee requested that the report which it presented the previous year be received as a final report.

Improved Design of Timber Trestles—A report on this subject, dealing exclusively with laminated timber, describes service tests conducted on the Southern and the Chesapeake & Ohio with lumber glued together for use as stringers, beams, caps, and posts. It also discusses in detail the species of wood used for these purposes, the kind of resin adhesive and method of gluing used, and the preservative treatment of this lumber. Additional test installations of laminated stringers, it said, are contemplated.

Fastenings for Timber Trestles—Specifications were prepared and presented by the committee on the design of fastenings for timber trestles and were recommended for inclusion in the Manual to replace existing material under the heading of Specifications for Metal Details used in Wood Bridges and Trestles, pages 7-5 and 7-6. The new specifications fix the metal to be used in the manufacture of nails, spikes, drift pins, through bolts, washers, packing spools and separators, lag screws, special castings, cap-stringer fastenings, metal joint connectors, brace plates and washer plates.

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† *Assistant Engineer of Bridges, Illinois Central.*

the labor savings derived from the elimination of soft spots in the track by pressure grouting, but also of the improvements made by the removal of slow orders and the speeding up of train operation. It concludes with the statement that the studies made to date of pressure grouting clearly indicate substantial savings in track maintenance, which often absorb stabilization costs in from one to three years' time.

The committee's entire report was received without discussion.

Work Equipment

EDGAR BENNETT, Chairman*

Final reports were submitted by this committee on railway-owned automotive equipment, concrete handling equipment, power jacks, and a handbook of instructions for the care and operation of maintenance-of-way equipment. Also, progress reports were presented on revision of the Manual; the standardization of parts and accessories for railway maintenance motor cars, portable conveyors, snow-removal equipment, and machinery and equipment for stabilizing roadbed.

Revision of Manual—The committee recommended changes in the Glossary, including the deletion of 65 words and terms, and a revision in the definition of a rail saw. Under this same assignment, the committee recommended a change in the text covering gasoline tanks—under the subject of Standardization of Parts and Accessories for Railway Maintenance Motor Cars—to include welded tanks, and also recommended that the material now shown under the subject, Methods of Maintaining Motor Cars, be reapproved without change. These recommendations were approved.

Standardization of Motor Car Parts—Giving consideration to the establishment of certain tolerances and specifications for bolted, demountable plate wheels for motor cars, the committee submitted a progress report on this phase of an assignment to investigate the standardization of parts and accessories for railway maintenance motor cars. It presented specifications for maximum tolerances of eccentricity, and for the metal to be used in the manufacture of motor car wheels, with the recommendation that these be included in the Manual with Fig. 2710. This recommendation was adopted.

Handbook on M. O. W. Equipment—For its assignment to prepare a handbook of instructions for the care and operation of maintenance-of-way equipment, the committee submitted a final report with the recommendation that, if adopted, the material be printed in handbook form as a supplement to the Manual. The report contains general instructions relative to safety, lubrication, loading and blocking, and also specific instructions for the care and operation of gasoline engines and their appliances, of Diesel engines, of 28 self-contained machines now in general use, and of 14 auxiliary tools and appliances. An eight-page index is appended for reference purposes. The committee's recommendation was approved.

Portable Conveyors—In a relatively brief progress report, presented as information, the committee stated that it found that the two types of portable conveyors, powered by gas engines or electric motors, which are generally used in maintenance-of-way work, are the belt-type car unloaders and the troughed belt conveyors. The first type mentioned, it said, is designed especially for unloading bulk material from hopper cars and is used with feeders on top of rails or in shallow pits. The second type mentioned, according to the report, is known as the general-purpose conveyor, and is designed for use in handling brick, material in bags, small boxes and loose parts. The report includes tables indicating the cost of operation and maintenance of two sand conveyors used for loading engine sand, and also descriptions of the machines.

Snow-Removal Equipment—A progress report by this committee includes a detailed discussion of the use of eight types of snow-handling machines. The on-track machines discussed include the snow-loader and melting tank outfit, weed burners, railroad push plows, and the spreader-ditcher, while the off-track units include tractor snow plows, the tractor bulldozer with plow and wings, and overhead loaders. Two other units discussed in the report are the truck-mounted snow-blower and the conveyor snow-loader—machines that can be adapted to both on and off-track use. In addition to general descriptions of the machines, the discussion covers the general application made and the amount of snow that can be handled by each.

Automotive Equipment—Supplementing a report made in 1939, the committee this year submitted a final report, as information, on railroad-owned automotive equipment. The report states that there is a trend toward the ownership of more of this equipment, not only in regions where the competition for labor is great, but also in lightly populated areas. Many trucks, it states, are used in busy terminal areas, and many others are being designed with special bodies and fitted with special tools and equipment for repairing work equipment on the line of the road.

Concrete Handling Equipment—After pointing out that this assignment covers a broad field of equipment ranging from shovels and wheelbarrows to large towers, elevators, chutes, etc., the selection and use of which are determined largely by the volume of concrete to be handled and the type of structures and topography of the surrounding ground, the committee, in a final report, describes the uses of several machines which are generally employed for this class of work. These descriptions cover paving mixers, truck mixers, elevators, concrete buggies, concrete mixers, portable hoppers, cableways, Pumocrete outfits, and concrete-handling buckets.

Power Jacks—A final report, as information, was presented by the committee on this subject. The report describes the machine and its operation, mentions how it is used to best advantage, and states that the power jack is considered both practical and efficient for the purposes for which it is intended.

Roadbed Stabilizing Equipment—In a progress report, presented as information, on its study of machinery and equipment for stabilizing roadbed, the committee first directed attention to a progress report presented last year by the Roadway and Ballast committee on Roadbed Stabilization. In this year's report, the committee describes the two methods used for the application of grout and the types and mountings of the machines in general use. Then, after stressing the importance of handling materials efficiently, it lists the various machines and accessories that are essential for a typical grouting operation of comparatively small size.

The entire report was received without discussion.

Wood Preservation

C. S. BURT, Chairman*

Although consideration was given to all of its 11 assignments, this committee submitted progress reports on only two, these including corrections to be made in the report of last year on the destruction of termites and possible ways of prevention, and a report on the investigation of incising forest products, both of which were presented as information.

Prevention of Termite Destruction—This year's report on this subject dealt with corrections to be made in the report presented by the committee last year, these corrections including changes in the material in the copper naphthenate treatment, revisions in some of the tables, and changes in some of the conclusions.

H. S. Loeffler (G. N.) noting that the report deals primarily with the prevention of termite destruction in new construction, expressed the thought that studies of the committee should be extended to include protection for existing structures located in termite territory. Chairman Burt replied that this suggestion would be given consideration in the future work of the committee.

Incising Forest Products—During the past year the committee made an investigation to determine the effect of incising, in accordance with A. R. E. A. specifications, on the penetration into white fir, eastern spruce and yellow birch crossties, and presented a progress report as information on this study. The report states that each tie treated was incised for half of its length and, after treatment, two sections were taken from each half and examined. Examination of the sections, it says, shows that no improvement is obtained in these species of wood by incising.

Although formal reports were not submitted on assignments relative to the re-

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* *Manager Forest Products Bureau, Illinois Central System.*

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view of specifications for creosote with particular respect to limitation of residue above 335 deg. C, the development of specifications for the treatment of wood to make it fire-resistant, and the preliminary conditioning of forest products for treatment by artificial methods of seasoning, the chairman of these respective subcommittees reported briefly on the work now underway.

Ties

C. D. TURLEY, Chairman*

Brief progress reports were submitted by the committee on four of its seven assignments. Excluding the report on revision of the Manual, which was presented for adoption, the other reports, all of which were presented as information, cover investigations as to the extent of adherence to A. R. E. A. specifications, substitutes for wood ties, and tie renewals and costs per mile of maintained track.

Revision of Manual—Under this assignment the committee checked the accuracy of all items originated by it and adopted prior to 1930, and in a progress report recommended the reapproval of the material shown under the headings, Installation and Keeping Records of Cross Tie Test Sections, Specifications for Tie Plugs, and Fundamentals to be Considered in Designs of Substitute Ties. Two changes were recommended in the material shown under the heading Marking Ties for Service Records, to insure the more accurate placing of dating nails, and a change was recommended for the use of aluminum instead of zinc tags. Under Conservation of Timber Supply, the report recommends a change in the text to point out more comprehensively how ties can be protected from mechanical wear. All of the recommendations were approved.

Adherence to Specifications—Continuing a practice prevailing before the war, the committee submitted a progress report on its investigation on the adherence to A. R. E. A. specifications, in so far as they relate to ties. The report states that generally satisfactory housekeeping conditions were found in seasoning yards, the only divergence from best practices being in the manufacture of ties, which was not up to pre-war standards, particularly as to tie size.

Substitutes for Wood Ties—Directing attention to a report made on this subject in 1940, the current progress report by this committee states that no additional installations of substitute ties have been reported. Concerning the substitute ties installed prior to 1940, the report shows that, of the 26,962 Brown concrete ties installed in the years 1925, 1927, 1928 and 1930, less than 30 per cent are still in service; of the 1,329,386 Carnegie, unsymmetrical steel I-beam ties installed during the period 1904 to 1923, only about 0.03 per cent are now in service; of the 983 Snyder steel and concrete ties installed in 1906, more than 98 per cent are in service; and of the 149,317 Dalton ties installed during the period 1927 to 1938, almost 99 per cent are still in service. The current high prices of wood ties, the report points out, make the subject of substitute ties a matter worthy of much consideration and study.

Tie Renewal Record—In a progress report regarding the number of tie renewals and costs per mile of maintained track, the committee directed attention to the tabulations of these figures published in a mid-year bulletin. The report attributes the decrease in tie renewals to a shortage of man-power in track maintenance, rather than to a shortage of ties. The rise in the cost of ties, which began in 1941, it said, continued through 1945.

* *Engineer of Ties and Treatment, Illinois Central.*

Masonry

F. R. SMITH, Chairman*

Detailed progress reports were presented as information by this committee on two of its nine assignments; one, dealing with specifications and principles of design of plain and reinforced concrete for use in railway bridges, buildings and culverts; and the other, on progress in the science and art of concrete manufacture.

Concrete Specifications and Design—Collaborating with six other standing committees, the committee submitted a report on this assignment, which was presented in two parts. The first part covers tentative specifications to be substituted for the present material shown in articles 301 to 310, inclusive, in the Manual, and will be submitted again next year for adoption, after they have been amended in accordance with any suggestions made. As presented, this part of the report includes information on the design loads for railway structures supporting tracks; design loads for highway bridges and buildings; a summary of working stresses; and design of reinforced concrete beams; reinforced concrete and composite columns; frames, beams and one-way slabs; two-way slabs with supports on four sides; flat slab construction; and footings. The second part of the report contains completely new specifications for the design of concrete transmission poles, which were presented for comment, with the idea of offering them for adoption at next year's annual meeting to replace the present material now appearing on page 8-75 of the Manual.

Air-Entraining Concrete—Under its assignment to investigate progress in the science and art of concrete manufacture, the committee presented a progress report on air-entraining concrete, which opens with the statement that this subject is the most important development in concrete technology in many years. The report states that the general result of tests, conducted in laboratories and in field experiments, shows marked benefits to be obtained by the use of air-entraining agents. The principle of air-entrainment is then described, along with the materials used to effect these results; the aggregates to be used for best results; and the various effects of air-entrainment on the usual properties of concrete. The advantages and disadvantages of air-entraining cements or admixtures are then discussed, followed by a review of design problems associated with these agents and precautions to be observed in their use. A bibliography of published articles relating to the subject of air-entraining concrete completes this report.

* *Assistant Chief Engineer in Charge of Bridges and Buildings, Union.*

Iron and Steel Structures

E. S. BIRKENWALD, Chairman*

Three of six assignments were reported on by the committee, including revision of the Manual, the relation of fatigue of metals in bridge design, and the development of an efficient and economical method of shortening eyebars to equalize stress.

Revision of Manual—This assignment was reported on in two parts, one, submitting six additional words with definitions for inclusion in the Glossary, and the other, covering 14 additions or deletions to clarify or simplify the existing text. The major revisions were with regard to the specifications for steel castings and the determination of impact.

Fatigue of Metals—In a final report, submitted as information, the committee stated that it was of the opinion that the testing and study of fatigue of metal in structures had been brought to a completion, even though work of the Committee on Fatigue Testing might continue along other lines. The report outlines the purposes for which the sub-committee was created and reviews all of the various reports submitted since 1940 on the various phases of fatigue testing, with references to where the reports can be found in the publications of the association.

Shortening of Eyebars—A detailed progress report was presented on the shortening of eyebars to equalize stress in them, the study of which led to the development of a method to shorten such bars by heating with oxyacetylene torches, which requires less time and less expense than any method used heretofore. The report includes a table showing the variation in live load stresses in eyebar truss members, and other tables showing the results of stress tests made with eyebars which have been shortened by heat treatment, with bars shortened by cutting and splicing with both fillet-welded and riveted joints, and with bars not shortened. According to the report, the results of the tests indicate that the shortening of wrought iron and steel eyebars by upsetting them while they are at a high temperature has no significant effect upon either their static or fatigue strength, whereas comparable tests on representative eyebar specimens shortened by more costly methods showed that the

* *Engineer Bridges, Western Lines, Southern.*

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fatigue strength of such specimens varied from 35 to 50 per cent of the fatigue strength of the original eyebar.

The report explains the procedure of flame shortening in detail, with descriptions of the equipment and tools required to carry out the work, and the manner of determining the stress in the eyebars with strain gages, before and after shortening. Among its conclusions, the report states that the flame-shortening method for eyebars not only eliminates costly train delays, because one hour is all that is required to treat one eyebar, but also that the equipment necessary for accomplishing the reduction in length is standard for bridge and building gangs, with the exception of the clamps and a pyrometer.

Buildings

H. C. LORENZ, Chairman*

This committee submitted one progress report and two final reports, as information, of its eight assignments.

Revision of Manual—The committee separated this assignment into two parts: one covering the revision of the material now appearing under Buildings in the Manual and the other covering pertinent material to be transferred from Chapter 23, for which subject there is now no standing committee, to the Buildings section. The revision recommended for adoption in the first part of this assignment includes matter pertaining to excavation, filling and backfilling; sewers and drainage; plumbing; built-up roofing; and parking facilities and signs for passenger stations. All recommended revisions were approved.

New Building Materials—On its assignment relating to the use of recently developed building materials in railway buildings, the committee presented a progress report as information. Stating that many new building materials have been introduced in recent years, while others have become so common as to no longer seem new, the committee pointed out that the ten materials covered in its report are not in general use in the railroad industry. The information presented covers the physical and mechanical properties of the materials, as well as outlines their uses as related to railroad facilities. The ten products described include corrugated glass, glass blocks, insulating glass units, silicone resin paints, enameled steel tile, vinyl resin floor tile, structural aluminum, precast concrete shapes, and cement-base paints.

Shop Building Ventilation—A final report, presented as information, on ventilation of railway shop buildings, particularly for Diesel locomotives, discusses the types of ventilation best adapted to blacksmith shops; boiler houses; carpenter shops; washer, locker and toilet buildings; Diesel engine repair shops (both the light-repair and heavy-repair sections); cleaning rooms; battery rooms; laundries; machine and erecting shops; paint shops; roundhouses and shop offices. A drawing accompanies the report to give "a complete picture of the present philosophy for better ventilation of shop buildings, including the elimination of monitor construction, and especially of top-hung sash." For best results as to capacity and all-around utility, the report states that the total height of the roof ventilator should be not less than 1.8 times the diameter of the stack, the width should be two times the diameter, and the exhaust area should be not less than three times the ventilator stack area.

* *Assistant Engineer, Cleveland, Cincinnati, Chicago & St. Louis.*

Impact

C. H. SANDBERG, Chairman*

Progress reports were presented as information by this committee on five of its nine assignments, each briefly discussing tests carried out during the last year. In reporting on four of its assignments, covering tests of viaduct columns, steel girder spans with open and ballasted decks, dynamic shear in steel girder and truss spans, and rigid-frame structures of steel and concrete, the committee told of its preliminary and exploratory work, the structures and members on which the tests were made, and stated that progress is being made on the analysis of the data. The committee stated that a final report has been prepared on the determination of the damping factors of steel spans and the variation in amount of damping with change in loading, by means of tests with an oscillator and model tests, but said that publication of the report is being deferred until the June-July, 1947, bulletin.

Cooperation with Universities

F. R. LAYNG, Chairman†

After prefacing its report with a foreword stating that it is the belief of the committee that the railroads, as a whole, are not taking adequate steps to protect their interests in that they are not establishing definite recruiting plans to secure college-trained men, and further, that studies show that on many railroads the average age of their engineer employees is much higher than is desirable, this committee submitted, as information progress reports on all of its four assignments.

Appreciation of University Training—One of the assignments of this committee is to stimulate greater appreciation on the part of railway managements of (a) the importance of bringing into service selected graduates of colleges and universities, and (b) the necessity for providing adequate means for recruiting such graduates and of retaining them in the service by establishing suitable programs for training and advancement. In some detail, the report discusses the success and failure of past employment practices, the need for better selection of supervisory personnel, the availability of properly trained replacements for key men, an employment plan, and a training and development plan. To illustrate its contention that adequate compensation must be offered by the railroads to attract graduates, the report presents information relative to the average salaries being paid to inexperienced and experienced employee graduates in manufacturing, utility, and railroad companies. The report endorses a plan that will afford opportunities to engineer graduates for eventually attaining managerial positions on the railroads.

E. M. Hastings, (R.F. & P.), speaking, not as a member of the committee or a past-president of the association, but as a member of the Engineers' Joint Council, which is composed of the past and present officers of the various engineering societies, advised of the studies being made by that council of the employment of engineering graduates, and reported that he had given the council a brief of the committee's report to assist it in its work.

He regretted to have to report that one of the council's studies indicates that the rail transportation systems of the country as a whole were employing fewer graduate engineers in proportion to their total employees than almost any other industrial group. In this regard, he said, studies showed that the railroads were classed in Group "D"—the lowest of the four groups classified—along with such manufacturers as soap makers.

W. C. Sadler, professor of civil engineering, University of Michigan, commented that it is not always true that the best railroaders come from honor societies, but that it is more natural that they come from the average students who are deeply interested in railroading. He thought that the railroads could assure themselves of securing graduate engineers if they would adopt a policy of hiring more undergraduates during the summer months, because he said that it had been his observation that if a man works for a railroad while a sophomore and a junior, the railroad will not have to fight for him as a graduate, regardless of salary.

He also offered the suggestion that since it is often the duty and pleasure of university instructors to advise undergraduates as to whether or not they should accept employment with a railroad, it might be well for the roads to try to sell these instructors on the merits of railroad employment. He thought there could be no better way to accomplish this than to hire a few such instructors during the summer months in any of the many capacities for which they are capable.

H. S. Loeffler (G. N.) suggested that a way to encourage college graduates might be to get rid of some of the obsolete titles now given them, and to offer new titles more commensurate with the type of work they must perform, such as architectural-engineer or structural designer, instead of draftsmen, etc.

Students and Railroad Vocations—A brief report was presented by the committee on its assignment to stimulate

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† *Vice-President and Chief Engineer, Bessemer & Lake Erie.*

among college and university students a greater interest in the science of transportation and its importance in the national economic structure, by cooperating with and contributing to the activities of student organizations in colleges and universities. The committee stated that plans are underway to have representatives from railroads address undergraduates at colleges and universities, supplementing their addresses with moving pictures showing railroad operation, construction and maintenance programs.

Cooperative Education—A report last year on this subject dealt with the railroad officer's point of view concerning the cooperative system of education for railroad service. This year, the committee presented a report on another phase of this subject—the fundamental objectives of the colleges that specialize in cooperative education. The report is based on information selected from a report by a committee of the American Society for Engineering Education, and outlines the requirements and aims of a cooperative college, the part that actual employment experience plays in the student's educational program, and the advantages both to the student and to the employer of cooperative education. In most of the cooperative colleges, it says, the student spends equal periods of time in school and in industry—the position being filled by two students alternating, which provides continuous service on one job.

Investigate Textbooks—On its assignment to investigate textbooks and other material available for instruction in railway engineering, and make pertinent recommendation thereon, the committee presented a progress report. From a survey made by this committee of the engineering courses currently offered in transportation by more than 90 engineering schools throughout the country, it found that the colleges with such courses fall into five groups: (a) those (18 in number) that require courses in transportation, transportation engineering and highway engineering combined, (b) those (10 in number) that offer elective courses in transportation, transportation engineering, or railway and highway engineering combined, (c) those (10 in number) that require courses in railway engineering, (d) those (11 in number) that offer elective courses in railway engineering, and (e) those (41 in number) that do not offer any courses in transportation engineering or railway engineering beyond route surveying.

Records and Accounts

F. B. BALDWIN, Chairman*

Four assignments were reported on by this committee, of a total of seven. The subjects on which reports were presented included revision of the Manual, a bibliography, the relation of construction reports and property records to current problems, and the study of valuation and depreciation accounting.

Revision of Manual—In addition to a recommendation for deleting 36 words and their definitions, revising the definitions of 29 other words, and adding two more words and definitions to the Glossary, the committee recommended the adoption of revisions to portions of five other pages in the Manual, dealing with the proper handling of records and accounts, that were originated by this committee. All of the recommendations were adopted.

Bibliography—Continuing its practice of previous years, the committee presented a bibliographical review of books, articles and pamphlets appearing from November, 1945, to November, 1946, inclusive, dealing with subjects in which it is interested.

Construction Reports—The committee presented a progress report, as information, on the relation of construction reports and property records to current problems. The report was framed to clarify some of the more important uses made of these records. One of the most significant of the uses, it points out, is with accounting for the cost of a railway acquired by purchase, merger, reorganization, or otherwise, to conform with the order issued June 16, 1941, by the Interstate Commerce Commission, which requires a radical departure from the accounting practices that have been in effect for 40 years or more. The construction reports and property records are used also, it states, with depreciation accounting, which became so important beginning January 1, 1943, and still more so on January 1, 1945, because of I. C. C. orders relating to accounting that went into effect on these dates. Although a set of records is required for reports to the Bureau of Internal Revenue, separate from those used for depreciation accounting, the committee report points out that the construction reports and property records are used for this purpose also, as well as for court hearings on bankruptcy; trusteeship or reorganizations; finance hearings; taxation purposes; rate cases; contractural relations between railroads; making retirements from accounts; estimating cost of new work; determining amount of fire insurance to be carried; and in establishing cost of fire losses.

Valuation and Depreciation—This assignment was broken down into three parts: (a) current developments in connection with regulatory bodies and courts; (b) I. C. C. valuation orders and reports; and (c) development of depreciation data. The progress report presented by the committee at this time, as information, covered only parts (a) and (c). For part (a), the report makes known the progress of the activities of the Bureau of Valuation of the I. C. C., and states that, in a report of June 20, 1946, the I. C. C. found the approximate aggregate value for rate-making purposes of the properties of Class I railroads to be $19,571,000,000 while the carriers gave testimony at a hearing held July 23, 1946, that a figure of approximately $22,164,000,000 would be reached if proper consideration was given to the increase in price levels since 1937.

Under part (c), the report gives consideration to a 118-page booklet entitled, "Depreciation Studies on Certain Items of Depreciable Roadway Property and Equipment for Application to Group Properties," issued on January 1, 1946, by the Engineering section of the Bureau of Valuation, I. C. C., and points out defects and discrepancies contained therein. The report also reproduces some of the tables used in the booklet to substantiate its criticisms.

Clearances

J. E. SOUTH, Chairman*

A report dealing exclusively with revision of the Manual, one of its three assignments, was presented by this committee. Of the 10 clearance diagram figures now appearing in the Manual, the committee submitted nine for reapproval, the one omitted being Figure 8 covering clearances for high platforms serving refrigerator cars.

Track

I. H. SCHRAM, Chairman†

Reporting in detail upon 9 of its 12 assignments, the committee covered a wide range of subjects dealing with track materials and maintenance practices.

Revision of Manual—Following a review of the material in the Manual which it had initiated, the committee recommended the revision of some definitions in the Glossary, a few other minor changes, and the complete revision of the material now appearing under the subject of Spirals. The recommended revisions were adopted.

Switches, Frogs, Crossings, Etc.—Under its assignment to study plans for switches, frogs, crossings, spring and slip switches, collaborating with the Signal section, A. A. R., the committee gave primary consideration to manganese steel frogs and crossings, both the insert and rail-bound types, and prepared the following plans, which it recommended for adoption:

Plan 621—Data and Sections for Rail-Bound Manganese Steel Frogs for Rails 112 lb. and Heavier.

Plan 622—Nos. 6, 7 and 8 Rail-Bound Manganese Steel Frogs for Rails 112 lb. and Heavier.

Plan 623—Nos. 9, 10 and 11 Rail-Bound Manganese Steel Frogs for Rails 112 lb. and Heavier.

Plan 624—Nos. 12, 14 and 15 Rail-Bound Manganese Steel Frogs for Rails 112 lb. and Heavier.

Plan 625—Nos. 16, 18 and 20 Rail-Bound Manganese Steel Frogs for Rails 112 lb. and Heavier.

Plan 750—Designs and Dimensions of Manganese Steel Inserts for Crossings of Angles from 14 deg. 15 min. to 45 deg. for Rails 6 in. and More in Height.

Plan 782—Articulated Manganese Steel Crossings, Angles 90 deg. to 60 deg., Incl.

Plan 783—Articulated Manganese Steel Crossings, Angles Below 60 deg. to 40 deg., Incl.

* *Valuation Engineer, System, Atchison, Topeka & Santa Fe.*

* *Engineer Bridges & Buildings, Pennsylvania.*
† *Chief Engineer, Erie.*

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The committee recommended minor revisions in five other plans, all concerning manganese insert crossings, with the exception of one, which referred to the changing of a dimension of an insulated gage plate. It also recommended the revision of the text under Appendix A, Portfolio of Trackwork Plans, relative to the fit of bolts.

As part of the same assignment, the committee presented a progress report on stress measurements on various designs of solid manganese crossing frogs. From the facts developed in tests on crossings reported on last year, the Taylor-Wharton Iron & Steel Co. designed and produced a crossing frog with increased girder strength across the flangeways, which was installed in place of one of the crossings under test at the B. & O. C. T. crossing at McCook, Ill. The report states that the new frog has effected a measurable, though limited, reduction in the flangeway stresses and may be expected to give good service performance. Other test frogs were installed and the report comments on the development of small flangeway cracks in them, supplementing its remarks with diagrams.

To lower the flexural stresses in the flangeways, a steel T-section type of frog support was designed and applied under a new crossing of the solid manganese type (about 90 deg.) in the crossing of the Indiana Harbor Belt and the Chicago & Western Indiana near 55th street and Cicero avenue in Chicago. Eight wire resistance gages were applied at critical or significant stress locations on the T-section and on the solid manganese crossing frog, and measurements were begun the second day after the installation was completed. From measurements taken at this experimental installation, several conclusions were reached, among which were the verification of the method of calculating stresses in the T-section, and that this type of support is effective in lowering flangeway stresses.

All of the recommendations of the committee with respect to new and revised plans were approved, but in the discussion which followed presentation of the report E. M. Hastings (R. F. & P.) raised the question as to why the railroads could not secure A.R.E.A. standard manganese guard rails with the 55 ½-in. guarding face. In reply, a representative of the railway trackwork manufacturers pointed out the difficulties involved in producing guard rails of this length and also mentioned that the price of such rails would be prohibitive.

Stresses in Tie Plates—Collaborating with the Committee on Ties and on Rail, this committee presented a progress report, as information, on the simplification of tie plate design. The report traces the history of this effort, which received its greatest impetus during the war, to reduce the number of sections, and which, at the beginning of the investigation, totaled 310 different sections from 18 in. to, but not including, 8 in. in length, and with 653 different punchings for plates down to and including the 10½-in. tie plate. From various meetings with the Special Committee on simplification and Standardization of Tie Plates of the American Iron and Steel Institute, 15 tie plate designs have evolved. Drawings of the 15 designs were included in the report which the committee submitted, with the statement that notice had been received from the manufacturers that plates of any of these 15 designs will be furnished at base prices, and that plates deviating in any way from these designs will be subject to extra charges. The report closes with the statement that the committee is of the opinion that the simplification of practice with respect to tie plate sections is greatly to be desired, and also that it is neither practical nor desirable to establish fixed dimensions for the punchings.

In presenting this report, Major J. de N. Macomb (Inland Steel Company) stated that since the publication of the subcommittee's report, an additional tie plate size has been added to those that will be manufactured at base price. In a prolonged discussion which followed the presentation of the report, there appeared to be some dissatisfaction with the restrictions imposed by the 16 plate designs proposed and the inference that designs were being established by the manufacturers rather than the A.R.E.A.. Replying for the manufacturers Major Macomb and E. W. Backes (Carnegie-Illinois Steel Corporation) pointed out that the proposed designs had been agreed upon through joint collaboration of the manufacturers and track committee, and that their selection at this time would not restrict progress in plate design in the future.

Welding Manganese Castings—In a final report on its assignment to study the welding of manganese castings in special trackwork, collaborating with the Committee on Maintenance of Way Work Equipment, the committee described the condition of the test welds on turnout frogs on the Toledo Terminal Railroad and presented its observations. The report lists nine general conclusions arrived at after the several years of tests both in the laboratory and the field, as follows: Cracked, laminated or defective metal should be removed by grinding before applying the welding material; the most desirable welding current for the 5/16-in. diameter bare rod is greater than 100 amp.; although the effect of the composition of the welding rod was not clearly defined in field tests, metallurgical examination of laboratory test specimens showed greater freedom from cracks and a better weld structure with the copper-molybdenum-manganese rod; removal of work-hardened surface by deep grinding before welding did not give noticeable benefit; the results from coated rods were indeterminate; good or fair welds were obtained in the field tests in some cases without peening, while laboratory tests showed definite benefits; although the weld applied on a flame-cut surface without grinding in the Mannheim field test gave good performance, a laboratory study indicated that this practice was detrimental to the metal surface; good welds can be obtained in cold weather; and the skill of the welder in minimizing shrinkage cracks, blow holes, or inclusions, may be expected to be an important factor in securing a long weld life.

Joint Lubrication—In its first progress report of laboratory tests, begun in 1937, for the prevention of frozen joints by rail joint lubrication, the committee described the rail joint slippage machine designed by the A. A. R. research staff (built by the Burlington and installed in its testing laboratory at Aurora, Ill.), to open and close the rail gap once a minute. The purpose of this machine was to study rail joint lubrication by producing wear on the joint bars and rail due only to slippage action, and to develop information on the most promising types of lubricants. Lubricants tested included Petrolatum, both the highly refined and the commercial grades, No-Ox-Id "A" Special, Texaco No. 904, Texaco Rust Proof "L," Texaco No. 45, Crater 1-X Compound, R. M. C. plastic joint packing, Leadolene No. 385, and Meropa No. 8. Several tests with each lubricant were made using both new and laboratory-worn head-contact and headfree 112-lb. A. R. E. A. 4-hole bars, and comparable tests were made using similar bars without any lubricant.

Summarizing, the report states in part that lubrication of a new rail joint was beneficial for about 500 cycles of opening and closing of the rail gap, and that, after regreasing, the benefits extended over a larger number of cycles; that there was no advantage in flame cleaning joint bars and rail ends unless a lubricant was used; that headfree joints require much smaller slippage forces to open and close the rail gap than head-contact joints; and that hand oiling a laboratory-worn head-contact joint without removing the joint bars was beneficial for about 200 cycles. Among the conclusions, the report states that the laboratory tests, which were made in the absence of wheel loads and weather, do not justify a commitment as to the types of lubricants or preservatives that should be most effective in minimizing rail joint wear and the occurrence of frozen joints in track.

The report on the second part of this assignment covers service tests of joints in the track, applied with and without lubricants, on a test section consisting of five miles of track laid with 131-lb. RE rail, 6-hole joints and slag ballast, on the westward main track of the Burlington between Leland, Ill., and Earlville, described in a report made last year. The current report describes the data taken by the research committee, and then comments as follows:

"Joint gap measurements failed to show any significant difference in the performance as to variation of joint gap widths between the various types of lubricants used or, whether any lubricant was used. The joint bar pull-in measurements showed some variation with individual lubricants but, inasmuch as the pull-in for this first year of service is largely the result of wearing away the mill scale, the report attributes little importance to these differences at this time. While the bolt tension data are not intended to reflect the merits of lubrication, they do show that the tension applied in 1945 (ranging from 20,000 to 22,300 lb. on the headfree joints and from 17,600 to 21,400 lb. on the head-contact joints) was insufficient to maintain all bolts above a tension of 5,000 lb., indicating that an average of 20,000-lb. bolt tension for the first year's life of new rail is

not too high." The report closes with the observation that these tests have been of insufficient duration to warrant any conclusions as to the relative performance of the various lubricants.

Placing of Anti-Creepers—A progress report on the three test installations of rail anchors applied in 1944 was presented by the committee on its assignment to study and submit recommendations on the number and placing of anti-creepers for various conditions. Two of the test locations are located on the Milwaukee in gravel ballast territory, one on 131-lb. rail near Mauston, Wis., for one-direction traffic, and the other on 112-lb. rail near Burlington, Wis., for two-way traffic. The third test location is located on the Illinois Central near Kankakee, Ill., in stone ballast territory, on track laid with 112-lb. rail carrying traffic in one direction only.

At the Mauston test location, from rail creepage measurements taken, the committee concluded that two methods have shown superior performance throughout the 33-month test, and with only 8 and 10 anchors, respectively. One of these methods places an anchor against the side of the 4th, 6th, 8th, 10th, 16th, 18th, 20th and 22nd ties from the receiving end of the rail, while the other method is the same except that anchors opposing a back-up movement are placed against the 7th and 17th ties from the receiving end of the rail.

From similar measurements, as well as observation of the tie movements, at the Kankakee test location, the committee concluded that four methods of anchorage continue to show the most satisfactory performance. These four methods involve placing the anchors quite uniformly throughout the length of the rail, with anchors against the same ties on the opposite rail.

Data taken on the test installation of the single track near Burlington show that, in a majority of miles, the north and south rails have moved in opposite directions; that staggered anchoring seems undesirable because of the excessive tie skewing; that an adequate number of anchors should be used to arrest creepage in both directions; and that, to obtain maximum rail restraint with the minimum number of anchors, the anchors should be spaced evenly throughout each half panel.

Reactance Value of Spring Washers—Continuing a study conducted since 1937 on a number of railroads on the reactive properties of spring washers and assembled rail joints, the committee presented a final report reviewing the test procedure and submitting its recommendations. The report points out that the bolt tension should not be permitted to fall below 5,000 lb. for the symmetrical type of joint to function satisfactorily in the track and to avoid accelerated joint wear. To meet the current A. R. E. A. recommendations that bolt tension of 20,000 to 30,000 lb. should be provided in the initial tightening of bolts in new joints, and thereafter that tension of 15,000 to 25,000 lb. should be used, the report states that a spring washer with at least 5,000-lb. reactive spring pressure at the release of 0.030 in. is highly desirable. Also, from the standpoint of track maintenance, a spring washer with a permanent travel of 0.10 to 0.12 in. when released from a load of 20,000 lb. to zero should be satisfactory. The report closes with the statement that if a spring washer having these suggested reactive features could be manufactured at a reasonable cost, it would be a valuable contribution to the maintenance of rail joints.

Speed Through Spring Switches—In a final report on its assignment to investigate the maximum speed through spring switches when points must be thrown by a train moving on the tangent track, collaborating with the Signal section, A. A. R., the committee found that there are very few cases where points are so thrown. Because of differences in the types of construction used, including weight of rail, length of points, reinforcing and bracing, and also on account of the differences in classes of power, the committee expressed the opinion that a maximum speed cannot be fixed and that each road will have to make its own decision.

C. H. Blackman (L. & N.) urged the importance of establishing a maximum permissible speed through spring switches under the conditions set forth in the assignment, but subcommittee chairman C. T. Jackson (C. M. St. P. & P.) repeated the belief of the committee that because of the many factors involved such a maximum speed cannot be fixed.

Hold-Down Fastenings—Collaborating with the Committee on Ties, this committee submitted its first progress report on its study of hold-down fastenings for tie plates and their design, and their use and economy with respect to minimizing tie wear. Two test locations were arranged on the tracks of the Illinois Central. The first covers three miles of a middle main track north of Manteno, Ill., which is laid with 131-lb. RE rail and 6-hole headfree joint bars, and surfaced with a moderately coarse stone ballast. All ties were renewed with 7-in. by 9-in. by 8-ft. 6-in. creosoted pine, gum, and oak ties, laid out-of-face on miles C-43, C-44, and C-45, respectively. The north half of each mile was plated with 7¾-in. by 13-in. by $^{27}/_{32}$-in. double-shoulder tie plates, whereas the south half of each mile was plated with Pennsylvania Railroad standard 7½-in. by 14¾-in. by $^{31}/_{32}$-in. double-shoulder tie plates. Each half mile of track was divided into seven equal parts with the same number of different arrangements of anchor spikes including: no hold-down spikes; four screw spikes; two screw spikes; four screw spikes with double coil washers; two screw spikes with double coil washers; four cut spikes; and two cut spikes.

The second installation covers a short test piece of main track carrying northward traffic near mile C-45, located about 1½ mi. north of Manteno, which is laid with 112-lb. RE rail. The test track includes 390 new creosoted gum ties plated with Illinois Central standard 7¾-in. by 13-in. by $^{27}/_{32}$-in. double-shoulder tie plates. In these ties two elastic spikes per plate were driven in diagonally opposite holes and the free ends of the spikes were positioned parallel with the rail.

The committee reported that initial tie plate penetration readings were taken at both of these installations in August, 1945, and September, 1946, but that since the average penetration measurements were very small, it is too early to draw conclusions.

Waterproofing

*C. E. ROBINSON, Chairman**

Of its two assignments, this committee submitted a progress report only on revision of the Manual, recommending the addition of a sentence to the item concerning arches, under the heading of Specific Cases on page 29-14 relating to the Principles Governing the Waterproofing or Dampproofing of Railroad Structures, to point out that special attention should be given to drainage and to the position of the fill to prevent the pocketing of water. This recommendation was adopted.

Wood Bridges

S. F. CREAR, Chairman†

Detailed reports were submitted by this committee on two of its eight assignments, one being a progress report on improved design of timber trestles, which was presented as information, and the other a final report on the preparation of specifications and design of fastenings for timber trestles, including metal joint connectors. Under another assignment to investigate the proper procedure to be followed in renewing creosoted timber ballasted-deck trestles, the committee requested that the report which it presented the previous year be received as a final report.

Improved Design of Timber Trestles—A report on this subject, dealing exclusively with laminated timber, describes service tests conducted on the Southern and the Chesapeake & Ohio with lumber glued together for use as stringers, beams, caps, and posts. It also discusses in detail the species of wood used for these purposes, the kind of resin adhesive and method of gluing used, and the preservative treatment of this lumber. Additional test installations of laminated stringers, it said, are contemplated.

Fastenings for Timber Trestles—Specifications were prepared and presented by the committee on the design of fastenings for timber trestles and were recommended for inclusion in the Manual to replace existing material under the heading of Specifications for Metal Details used in Wood Bridges and Trestles, pages 7-5 and 7-6. The new specifications fix the metal to be used in the manufacture of nails, spikes, drift pins, through bolts, washers, packing spools and separators, lag screws, special castings, cap-stringer fastenings, metal joint connectors, brace plates and washer plates.

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Roadway and Ballast

W. C. SWARTOUT, Chairman*

Including revision of the Manual, this committee presented reports on the physical properties of earth materials, the prevention of erosion in natural waterways, methods used for the stabilization of roadbed, tests of ballast aggregates, and ballasting practices. Final reports were submitted for for adoption on the structural support of struts and piling, and specifications for riprap.

Revision of Manual—The text, originated in 1932 and revised in 1937, on Means of Protecting Roadbed and Bridges from Washouts and Floods, was submitted for reapproval without change. New specifications were presented for cast iron culvert pipe to make them conform with the revised specifications of the American Society for Testing Materials. The committee meticulously reviewed all of the material now shown in its chapter in the Manual, with the result that 14 subjects were submitted for reapproval without change, several others were submitted for approval with minor changes, 60 word definitions were deleted from the Glossary, and 15 definitions were revised for clarification. All recommendations were approved.

Physical Properties of Earth Materials—In a brief progress report on its investigation of the load capacity of the roadbed, the relation of the roadbed to the ballast, and allowable pressures, the committee stated that it is too early to consider conclusions. However, the report states that substantial savings in maintenance expense is evidenced on those railroads that have undertaken roadbed stabilization work, and that further study is being made to ascertain what happens to the roadbed to produce a more stable base for the track structure. Concerning the allowable pressures on roadbeds, the committee, pointing to the excessive expense of maintaining satisfactory line and surface in some territories, stated that it should not be surprising to find that much of the roadbed is overstressed and that current research may result in a better complete track design, with better balance between the roadbed, the track structure and the ballast.

Prevention of Erosion—Excepting the method of installing check dams for the control of erosion from its current report, because a detailed description of that method was included in the Manual in 1944, the committee submitted a progress report on the prevention of erosion in natural waterways by three other methods, i.e., riprap, channel relocations, and plantings. Without attempting to cover in any detail the method of protecting banks by piling up loose stone, the report discusses the method of placing riprap on a prepared bed, with the stones carefully placed and tamped to form a paving, the interstices either filled with grout or not, and with particular attention to the toe of the stone mat to prevent undermining. Commenting on channel relocations, the report cautions that consideration should be given to state and federal laws prohibiting any changes in the courses of streams and suggests that complete plans be submitted to the proper governmental agency for approval. Also, it points out, the rights of owners of property, both upstream and downstream, should be carefully considered to determine whether or not they will be affected. Discussing the planting method of preventing erosion, the report states that this method is both possible and practical in almost all sections of the country. The method is then described and suitable species of grasses, shrubs and vines are recommended for this purpose.

Stabilization of Roadbed—The current report of the committee was the second presented on the progress of its investigation of methods used to effect roadbed stabilization. The report this year is limited entirely to a study of roadbed stabilization by pressure grouting, and discusses in detail the equipment being used for this purpose and the grouting slurry mixtures. An inspection trip was made by the committee over the grouted areas that were reported on last year, and the report comments on the service performance of these projects on the Rock Island, the Katy, and the Milwaukee, stating that, while this work has been only partially successful, maintenance expense has been greatly reduced.

Pressure grouting continues on various roads in increased volume, with a number of roads adopting the procedure for the first time, according to the report. New projects in 1946 included several on the Santa Fe, the Baltimore & Ohio, the Burlington, the North Western, the Illinois Central, the New York Central, and the Pennsylvania, all of which are discussed in detail in the report as to the general procedure, grouting slurry mixes, and the results obtained. With the view of obtaining more definite information on pertinent costs, characteristics of subgrade instability, and methods of correction, a data sheet was sent by the committee to 26 railroads, on which costs may be kept, and proposing the establishment of test sections.

Address by Prof. Peck

In his address at the Wednesday morning session, on Soil Mechanics as Applied to Railroad Roadbeds, Prof. Peck pointed out that there is one condition that appears to be common at all soft spots and all ballast pockets — they are underlain by plastic clay subgrades. The amount of clay required to produce an unstable track condition must be extremely small, he continued, and the quantity of water required to produce instability is so small that a drainage system would have to be almost perfect to avoid leaving tiny pools of water here and there on the surface of the subgrade.

It has long been know, he stated, that clay soils cannot be drained by gravity in the ordinary sense of the word, since the voids between the minute particles in a mass of clay are so small that water is held in them by capillary attraction, and the capillary forces due to surface tension of the water are greater than the forces of gravity that tend to pull the water out of the voids. Furthermore, even a very slight amount of rainfall would be sufficient to supply water to the voids of a clay soil far more rapidly than the water could possibly be pulled through the clay soil into a drainage system, on account of the extreme resistance to the flow of water in the fine passages.

He then stated that the injection of grout seems beneficial in many instances where the grout enters the roadbed and is distributed in more or less flat seams, many of which are likely to be located on top of the clay at the bottom of the ballast. He presumed that one action of the grout is to prevent mixing of the water and the clay at the junction of the ballast and the subgrade, thereby setting up a barrier to the development of a clay slurry. The importance of this and other factors is to be investigated during the coming year by a series of laboratory tests.

Mr. Peck did not want his statements to be construed to mean that drainage, as such, is not useful or desirable, especially in fine sands and other semi-permeable soils, yet he pointed out that the procedures for draining fine sands and course silts have not been entirely successful. Taking up the matter of French drains and perforated pipe drains, he stated that the service life of drains could be prolonged indefinitely by even rather crude attempts to insert one or more materials of intermediate size between the drain and the soil from which the water is taken.

Structural Support—A report on this assignment, particularly as to struts and piling, was submitted last year and, since no suggestions for improvement were received by the committee and no revisions made, the report was resubmitted and recommended for adoption and publication in the Manual.

Ballast Tests—Under this assignment, the committee commented on the need for the development of a rational design for the entire track structure so that none of the elements involved—the rail, the tie, the ballast, or the underlying subgrade—will be overstressed. To further this development, the report of the committee presents a suggested laboratory stability test for ballast, which includes a description of the apparatus, the ballast specimen, and method. It also describes the Los Angeles abrasion test for testing stone, slag, and gravel ballast.

Ballasting Practices—Revised specifications for cinder ballast were presented for comment or criticism by the committee with the expectation of submitting them next year for adoption and publication in

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the Manual. In its report, the committee pointed out that higher train speeds, greater wheel concentrations, increased cost of labor, reduced availability of laborers for section and extra gangs, increased cost of materials, reduced availability of funds for maintenance, stabilization of roadbed, mechanical and electric tampers, and mechanical shoulder ballast cleaning machines, all have affected ballasting practices, and it recommended the appropriation of funds to continue the investigations initiated and carried on by the late Dr. A. N. Talbot on the load distribution by ballast.

Riprap Specifications—In 1944 the committee presented a tentative draft of specifications for riprap and requested comments and criticism. Since none have been received, the committee submitted the specifications with the recommendation that they be adopted and published in the Manual. The recommendation of the committee was approved.

The entire report of the committee was accepted without comment.

Rail

C. B. BRONSON, Chairman*

In some detail, this committee reported on 17 subjects having to do with rail and related matters, including the usual rail failure statistics, revision of the Manual, mill practice and manufacture, economic value of different sizes of rail, continuous welding, service tests of joint bars, joint bar failures and consideration to revision of design, cause and remedy of corrugated rail, development of fractures under engine burns, causes of shelly spots and head checks, and recent developments affecting rail design.

Revision of Manual—Under this assignment the committee recommended the deletion of the material appearing under the heading Standard Location for Tension Test Specimens and for Boring for Chemical Analysis appearing on page 4-13; a few other minor changes; and the reapproval of the present material appearing in the Rail chapter for the specifications for both high-carbon-steel and quenched carbon-steel joint bars, the design of track bolts, and the building up of rail ends in track. Also, included with this report was a tally of the balloting on the revisions of the 112-lb. RE and 131-lb. RE rail sections and joint bars, which shows that the membership as a whole was in agreement with the recommendations of the committee to withdraw the plans of the 112-lb. rail and joint bars, substituting therefor new plans for a 115-lb. RE rail section and joint bars, and to withdraw the plans for the 131-lb. RE rail section and joint bars, replacing them with plans for both 132-lb. and 133-lb. rail sections and joint bars for each, with appropriate revisions to page 4-12 in the Manual to cover the rail drilling. All revisions were approved as presented.

Rail Failure Statistics—For the second consecutive year, the number of reported transverse fissure failures showed a reduction when 36,520 were reported for 1945, divided 5,707 service and 30,813 detected failures, according to the report of this committee. Since there have been only 50 (18 more than were reported last year) transverse fissure failures reported in all contract control-cooled rail to December 31, 1945, the report states that it is evident that substantially all of the transverse fissure failures have occurred in other process rails, and that failures in all rails of all ages, made by all processes, will decrease as the percentage of control-cooled rail increases.

The rapid rise in the use of control-cooled rail is pictured in a diagram contained in the report, which shows that the percentage that the mileage of control-cooled rail bears to the total rail increased from 14 per cent in 1935 to 91 per cent in 1939, and to 99 per cent in 1944. With another chart comparing rail failures of all types from date rolled to December 31, 1945, per 100 average track miles of control-cooled with other process rail, the report shows the striking contrast of the low failure rate in control-cooled rail with the erratic record and high failure rates of the other process rails.

Economic Rail Sizes—In its study of the economic value of different sizes of rail, based on replies received from 31 representative railroads to a questionnaire, the committee stated in a progress report that the principal reasons for replacing rail are: (1) to obtain relay rail; (2) too worn and too light weight for good riding at high speed; (3) development of failures; (4) end batter; and (5) head wear on curved alinement. Further, that the average age of rail recently replaced is 18.5 years, ranging from a minimum of 12 to a maximum of 26 years. The report brings out the fact that present rail is carrying an annual tonnage considerably in excess of that which it is estimated will justify a heavier rail section. This may mean, it says, that the estimates of tonnage sufficient to justify a heavier rail section should be further analyzed, that the roads are behind in laying the heavier rail section, or maybe that other factors besides tonnage have an important part in the selection of a rail section.

Continuous Welding—Collaborating with the Track Committee in its further study of continuous welding of rail, the committee summarized its report in tables showing the number and extent of installations of continuous welded rail to date, a summary by welding processes of installations in tunnels and in the open, and additional failures. The failure table shows that a total of 47 failures were reported in 10 different installations.

Service Tests of Joint Bars—Reporting on its assignment to make service tests of various types of joint bars, the committee presented an extensive annual report, as information, complete with tables, charts and illustrations, covering the service performance to date of different types of joint bars installed in nine locations of 112-lb. RE rail on the Atchison, Topeka & Santa Fe, and in 12 locations of 131-lb. RE rail on the Pennsylvania. The observations and measurements of these installations were continued during 1946, the principal measurements including: (a) joint camber on rail head; (b) rail surface profile; (c) rail joint deflection; (d) out-to-out distance of bars; and (e) bolt tension.

From this data the report sets forth the following conclusions. The performance of all of the various types of joints on the end-hardened rails on both the Santa Fe and Pennsylvania is outstandingly better than that on the unhardened rails. The low rate of rail head wear at these locations means that these rails should not have to be removed from tangent track for many years due to head wear. The service life of 36-in. bars on the Pennsylvania is greater than 1.5 times that of 24-in. bars, while on the Santa Fe, results show that a longer service life may be expected for unhardened rail when equipped with longer joint bars. To date there is no appreciable difference in the performance of the controlled-bearing head and base bars and full-bearing bars of similar design. The performance of head-free bars is as good as the average performance for head-contact bars of comparable length and section. In general, the short toe design of angle bars is giving equal or superior performance. In the Pennsylvania tests, the relatively light weight section F-4 bar is giving as good or better performance than the other, much heavier bars.

Joint Bar Failures—As part of its assignment to investigate joint bar failures

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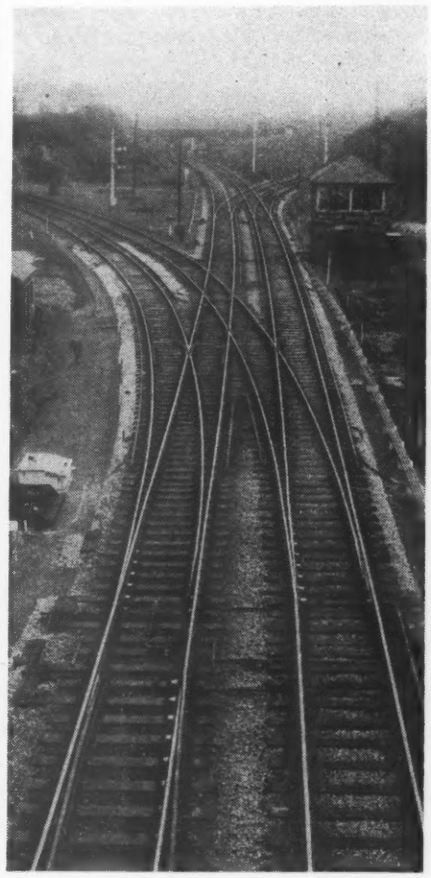

Benton Quarry Junction on the London & North Eastern

* *Inspecting Engineer, New York Central System.*

and give consideration to the revision of design and specifications, the committee submitted as an appendix the fifth progress report of the rolling-load tests of joint bars being conducted at the University of Illinois under the direction of N. J. Alleman, special research associate professor of engineering materials.

This report, in the form of a monograph by Professor Alleman, makes several observations of the year's tests. It states that joint bars for 131-lb. RE rail, subjected to a wheel load that was increased in proportion to the increased modulus of the bars, render approximately the same joint bar life as the 112-lb. bars; that the cyclic life of the 131-K14 36-in. bars tested was somewhat longer than that of 24-in. bars of the same type; and that the average cyclic life of TR bars was greater than that found with the 112-B34 bars. Rolling-load tests on one lot of 112-B34 bars show an increase of cyclic life resulting from shot-peening. Variations in hardness from bar to bar of the same heat may result from variations in quenching temperature. The report also observes that surface decarburization usually found on joint bars is readily detected in the Rockwell test.

Corrugated Rail—Concerning its assignment to study the causes and remedy of corrugated rail, its effect upon riding qualities of tracks and upon the costs of track and equipment maintenance, the committee submitted a second progress report by R. E. Cramer, special research associate professor of engineering materials, on an investigation made by him in 1946 at the University of Illinois. The report describes a laboratory experiment to develop hard spots on new rails by wheel slippage, which was accomplished by tacking several specimens, taken from the head of a new rail, onto a brake shoe, and then pressing them against a spinning car wheel for different lengths of time, at different pressures, and at different wheel speeds. The tests show that high hardness can be caused by spinning wheels heating rail steel to the quenching temperature of the steel, followed by the rapid cooling caused by the adjacent cold steel. Professor Cramer expresses the opinion that enough spinning of locomotive drivers could take place on rails in track to make some corrugated spots, when heavily loaded trains are increasing their speed under full steam pressure.

Fractures Under Engine Burns—Continuing its study of the development and characteristics of fractures under engine burns in rail, together with investigations as to the effectiveness of welding up such burns, the committee submitted a progress report, as information, of rolling-load tests on engine-burned rails, which tests were slowed up owing to the heavy strains imposed upon the machines. Twenty-eight specimens were obtained from the tracks of the Southern, but after the first 15 were tested in the machines, it was noted that the results were of a scattering nature. Engine burns were then reproduced by securely anchoring a Mikado type locomotive and causing its wheels to spin on the specimen rails for approximately five seconds.

Some of the specimens were built up by welding and some were not, after which they were tested in the rolling-load machine. The report states that, although the sample of data is small, the results indicate that the welding of engine-burned rails is an improvement over leaving them unwelded.

As part of this same assignment, the committee submitted a report on rail structure changes caused by engine driver burns, as observed in an investigation conducted under the direction of V. C. Williams, chairman, chemical engineering department of Northwestern Technological Institute. In his report, Professor Williams describes the preparation, testing, and results of examination of rail structures damaged by spinning locomotive driving wheels, giving rise to visible effects called "engine burns." In conclusion, the report states that a driver burn of a rail causes extreme hardness because of the development of a martensitic structure; that martensite transformation apparently creates quench cracks which greatly reduce the fatigue resistance and may hasten failure; and that attention should be given in the repair of driver burns by welding to removing parent metal containing quenching cracks beyond each end of the burned area, in addition to the burned metal, before weld metal is applied.

Shelly Spots and Head Checks—The committee submitted a progress report, as information, on its assignment to investigate the causes of shelly spots and head checks in rail surfaces for the purpose of developing measures for their prevention, to which were appended reports on field stress measurements by the Engineering Division research staff, a fifth progress report of the shelly rail studies at the University of Illinois, and a program of study on shelly rails at Battelle Memorial Institute.

The committee report states that no solution for this problem has yet been found but that the most promising developments so far appear to be the three per cent chrome steel, the modified head contours, and heat-treated rails. The report presents the following comments relative to progress to date: No definite relationship is indicated between mill chemistry and shelling, except as the hardness of the running surface is affected. The data reveal no definite trend. Tests show about the same shelling and flaking with or without rail lubricators. Transposing shelly rails from the high to low rail on curves is well worthwhile, if done in time. Tests indicate little, if any, advantage for slow-rolled rail. High-carbon rail will not eliminate shelling, but retards it more than ordinary carbon rail. When 1/32 in. was machined from the head contour of some used normalized rails and laid in shelling territory, they developed flaking and considerable shelling. The three per cent chromium rail laid on 4, 5, 6 and 7-deg. curves in August, 1944, and in April and July, 1945, are in excellent condition, except that a few rails in the 7-deg. location have shelled and were removed for analysis. Heat-treated rails laid on curves in April, 1943, showed some flaking but no shelling as compared with severe shelling on standard rails laid at the same time on the other half of the curve. Tests of curves laid with control-cooled and hotbed-cooled rails indicate that shelling is not chargeable to control cooling.

Concerning the studies of the Engineering Division research staff on this assignment, the report mentions a few installations of rail with a modified head contour, which indicate that some benefit may be realized from this rail section although the tests are not old enough to warrant comments. It further states that no difference in shelling has been observed on rails laid on a 1:20 cant and on a 1:40 cant.

Field Research on Shelly Rails—The fifth progress report on that portion of the shelly rail studies assigned to the Engineering Division research staff is appended to the above report and presents data pertaining to rail shelling from tests made on 131-lb. rail on the six-degree curve under observation on the westbound track of the Norfolk & Western. Stress measurements were made on the rail web and fillets on the outer rail of this track, which shows shelling and carries loaded coal cars, and on the rail in the eastbound track which carries empties and evidences no shelling. No significant differences were found between the maximum stresses obtained to explain the occurrence of shelling on one and not on the other. The measured stresses were higher under the loaded cars than under the unloaded cars, but the magnitude of maximum stresses at all gage locations was only about half as great under the loaded coal cars as under individual wheels of the locomotive.

Laboratory Research on Shelly Rails—Also appended to the above report is the fifth progress report of the shelly rail studies at the University of Illinois, prepared by R. E. Cramer, special research professor of engineering materials. This report presents the results of rolling-load tests to induce shelling on nine rail specimens, which show that heat-treated low alloy rails are much superior to any of the other specimens and compare very favorably with the three per cent chromium rails and heat-treated carbon-steel rails described in last year's report. The report also comments on observations made of rail laid new in 1943 on four test curves on the Chesapeake & Ohio, noting that shelling developed on the 5 and 6-deg. curves at 45 million tons of traffic, while the one 3-deg. curve did not develop shelling until it had 86 million tons of traffic.

Metallographic Examination of Shelled Rail—Appended also to the above committee report was the announcment that a study was initiated at Battelle Memorial Institute on June 1, 1946, for the purpose of making critical metallographic examination of shelled rail and of attempting to correlate the mechanical properties of rail steel with shelling. Some 30 samples of shelled rail have been sent to Battelle and preliminary examination of a few has suggested that shelling may begin at the rail surface on the gage side of the head more frequently than has been recognized in the past.

Developments in Rail Design—Under its assignment to investigate recent devel-

opments affecting rail design, the committee submitted an extensive report on the stress measurements taken on 131-lb. RE rail in tangent track and in a 6-deg. curve on the Norfolk & Western, a summary of the stress measurements on 90-lb. ASCE and 112-lb. RE rail in 18-deg. curves, and a laboratory report on the fatigue strength of rail web specimens. All of these reports were submitted as appendices.

The report on stress measurements on 131-lb. rail (Appendix A) is a further analysis made by the research staff of the stress measurements made under traffic on the Norfolk & Western in 1945. The report outlines the purpose of making the tests, describes the testing apparatus and its application, and tabulates the stress measurements. Several conclusions were reached from the study and calculations, as follows: The range of stress measured in the 131-lb. rail in tangent track and in the outer rail of the 6-deg. curve under regular traffic did not exceed the endurance limit of rail steel at any of the positions at which gages were located, but on the inner rail of this curve, at the upper web fillet and upper portion of the gage side, occasional localized compressive stresses were considerably above the endurance limit. New rolled crown tie plates produce stresses at certain rail-section locations that range above the endurance limit of rail steel, while at the same positions with worn rolled crown tie plates, the stresses are well within this limit. A method has been developed to calculate applied individual wheel loads on each rail from the measured direct stress in the rail web. When the applied load on one wheel of a driving axle is far above nominal on one rail of the curve, the load on the other wheel of the axle is correspondingly lighter. On the inner rail of the curve, the heaviest applied driving wheel loads almost always have their eccentricities of bearing well towards the gage corner of the rail head.

The report on fillet and web stress measurements on 90-lb. and 112-lb. rail in 18-deg. curves (Appendix B) is a summary of the tests conducted by the research staff on the Detroit, Toledo & Ironton during June, 1946. The report explains that the test was made on sharp curves (where fillet cracks have developed in the upper web fillet on the gage side and in the lower web fillet on the outside of the 90-lb. ASCE inner rails) to determine whether the type of power used was causing the failures and if substitution of heavier rail could be expected to eliminate fillet cracks on these sharp curves. The tests were made on an 18-deg. curve laid with 90-lb. ASCE rail, branded 1926 and 1928, and on an 18-deg. curve laid in 1945 with 112-lb. RE rail.

Summarizing the tests, the report states that the measured localized stresses in the 90-lb. inner rail of the 18-deg. curve under the 700 class (2-8-4) and 811 class (2-8-2) locomotives are so extremely high that a new rail of this section might be expected to develop cracks at either the upper web fillet on the gage side or at the lower outer fillet after the passage of a few hundred to a few thousand of these engines. Some failures in the outer rail under these engines could occur after a moderate period of time. The 400 class (2-8-0) locomotives and all tenders tested on this curve with the light rail would never be expected to produce cracks in the upper portion, although cracks might start in the lower outer web fillets after the passage of many thousands of these units.

The measured stress range in the 112-lb. inner rails of the 18-deg. curve under the 700 class and engine 811 might be expected to develop upper inner web fillet cracks at 10,000 to 50,000 passages, and some failures in the upper inner web fillets of the outer rails could occur after a moderate period of time. In closing, the report states that the new 115-lb. rail, if laid in the 18-deg. curves, could be expected to serve for a long time, but that fillet cracks might occur after the passage of at least 100,000 of the 700 and 800 class locomotives.

Appendix C to this report is a progress report by R. S. Jensen, special research associate of engineering materials, University of Illinois, which dealt primarily with the reduction in fatigue strength of rail webs from corrosion. Tests revealed that the fatigue strength of a very rusty rail was about 3½ per cent below that for the non-corroded specimens. Tests were also conducted on specimens subjected to corrosion by a very active solution of sulfuric acid, to simulate conditions in tunnels, and the first crack developed after 17 hr. Further tests of specimens under acid are contemplated after first painting them with protective coatings.

Thirteenth Progress Report on Rail Failures—Also appended to the report of the Committee on Rail is the Thirteenth Progress Report of the Cooperative Investigation of Failures of Railroad Rails in Service and Their Prevention, which is being conducted by the Engineering Experiment Station, University of Illinois, in cooperation with the Association of American Railroads through the Committee on Rail, and with the rail manufacturers through the Technical Committee on Rails of the American Iron and Steel Institute. This report deals with the examination and classification of 46 control-cooled rails sent to the University laboratory in the period from September, 1945, to September, 1946, of which 22 rails were found to contain transverse fissures from porosity, but none with failures from improper control cooling or shatter cracks. It was found that most of 62 transverse and compound fissures from porosity, which have been studied, have come from two rail mills which reheat their blooms for final shaping of the rails. Since no fissures from porosity have been found in rails from the three mills which do not reheat their blooms, the report states that it appears that overheating causes the steel to tear apart during rolling, leaving a porous condition inside the rail heads. Since this cause of porosity was discovered by mill metallurgists, few such rails have been produced.

Calculating Maximum Rail-Web Stress—A monograph, published in Bulletin 461, October, 1946, was prepared by C. J. Code, engineer of tests—maintenance of way of the Pennsylvania, which describes a method of calculating the maximum stress in the web of rail due to an eccentric vertical load. This method is principally empirical and is based on a series of tests conducted at the Altoona laboratories of the Pennsylvania, using Stresscoat to determine the location of maximum stress and wire resistance strain gages to determine the magnitude of the stress. Mr. Code points out that, although the maximum stress obtained by his method is not the true stress which would have been obtained by a rosette measurement and calculation, the error in the result is small and of little importance since failures seem to be due to compressive stresses or strains beyond the maximum compressive strain.

The report states that stress measurements show that the web of the rail is subjected to a column type of loading, which is a combination of axial compression and bending, and that the maximum stress is always found near the bottom of the top fillet curve, and is compressive, being a combination of direct compressive stress and bending stress. The report outlines five steps to compute the bending stress, with the assistance of accompanying graphs, followed by three steps to obtain the direct stress and—adding the two results—the total stress. The latter is on the basis of a 20,000-lb. load with ¾-in. eccentricity, which can be changed easily by direct proportion to fit other loads and other eccentricities.

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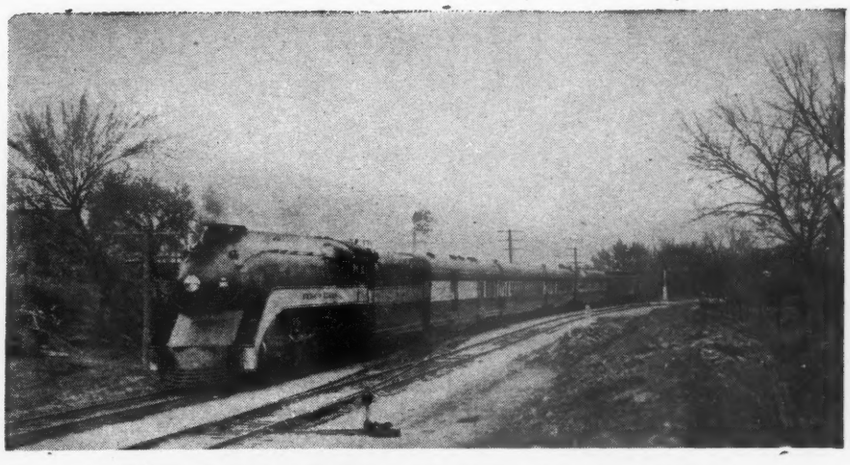


The St. Louis-San Francisco "Firefly" at Spencer, Oklahoma

N.R.A.A. Products Exhibit at Chicago Was Largest in Past 20 Years

Latest developments in equipment and materials applicable for use in the construction and maintenance of railway properties were displayed at Coliseum by 101 companies

COINCIDENT with the convention of the American Railway Engineering Association at Chicago on March 18-20, the National Railway Appliances Association presented its thirty-second annual exhibit of materials, devices and equipment used in the construction and maintenance of railway tracks, bridges, buildings and water-service facilities. Opening on Monday, March 17, a day ahead of the A.R.E.A. convention, the exhibit, which was held at the Coliseum, continued through Thursday, March 20, with 101 companies participating. Thus, measured by the number of companies taking part, it was the largest exhibit to be held by this association for about 20 years.

Since this was the first full-scale exhibit of the N.R.A.A. since 1941, it presented an opportunity for those companies participating to show many new and improved types and models of materials, appliances, power tools and other equipment that had never been displayed before. This fact, combined with the present imperative need for using the most economical and effective methods and materials in railway maintenance work, seemed to enhance the appeal of the exhibit to those responsible for such work.

W. J. Hanna
President

The officers who had the responsibility for arranging and supervising the exhibit of the N.R.A.A. this year were: President, W. J. Hanna (Republic Steel Corporation), Chicago; secretary, C. H. White (Industrial Brownhoist Corporation), Chicago; treasurer, V. E. McCoy (National Aluminate Corporation), Chicago; directors—Lem Adams (Oxweld Railroad Service Company), Chicago; C. L. Mellor (Barco Manufacturing Company), Chicago; H. M. McFarlane (O. F. Jordan Company), East Chicago, Ind.; F. P. Cullen (Cullen-Friestedt Company), Chicago; W. F. Kasper (Fairmont Railway Motors, Inc.), Fairmont, Minn.; and M. K. Ruppert (The P. & M. Company), Chicago.

New Officers

The association held its annual meeting at the Coliseum on Tuesday morning, March 18. In the election of officers Mr. Mellor was elected president, Mr. Kasper was elected vice-president, Mr. White was re-elected secretary, and Mr. Ruppert was elected treasurer. E. D. Cowlin (Eaton Manufacturing Company—Reliance division) and W. H. Tudor (International Harvester Company—Industrial Power division) were elected directors to serve for two years. R. A. Carr (Dearborn Chemical Company) and Jess Mossgrove (Austin-Western Company) were elected directors to serve for three years. Mr. Hanna will remain as director pro tem for one year.

Exhibitors

The companies participating in the exhibit, with the products on display and the representatives present, were as follows:

A

Achuff Railway Supply Company, St. Louis, Mo.: rail anchors, spring washers; G. W. Achuff, Harvey G. Rowe, A. Milton Wells.

Air Reduction Sales Company, New York; rail-cropping machine, carbide lamps, flame-cleaning and dehydrating apparatus, display of acetylene-oxygen-helium-argon-nitrogen-carbonic gas and hydrogen cylinders; L. D. Brennon, C. A. Daley, J. M. Driscoll, W. Love, W. P. Kellog, J. W. Kenefic, L. C. McDowell, U. F. Portell, E. F. Turner, D. J. Williams.

American Fork & Hoe Co., Cleveland, Ohio; rail anchors, tapered joint shims, rail forks; D. L. O'Brien, C. C. Connolly, W. E. Kelly, J. J. Nolan, Frank J. Reagan, John Skeel, R. J. Whalen.

American Hoist & Derrick Co., St. Paul, Minn.; model of Diesel-electric locomotive crane, blocks and sheaves, hand winches, clips; L. E. Coulter, S. M. Hunter, E. S. McCormick, R. H. Smallwood.

Armco Drainage & Metal Products, Inc., Middletown, Ohio; air pipe, flex-beam guard rail, bin-type retaining wall, water gates, pipe arch, asbestos-bonded culvert pipe, multi-plate pipe, flow-model pipe and pipe arch; W. T. Adams, C. H. Anderson, G. R. Betts, Fred Bolton, E. L. Campbell, H. S. Claybaugh, E. T. Cross, Van Davis, J. D. Faylor, Chris Fisher, A. J. Mistler, N. A. Powell, W. O. Robertson, W. B. Roof, K. A. Smith, W. H. Spindler, R. N. Tracy, Felix Truss.

Austin-Western Company, Aurora, Ill.; models of railroad dump cars; Jess Mossgrove, George Sines.

B

Barco Manufacturing Company, Chicago; lightweight unit tie tamper, heavy

C. H. White
Secretary

duty unit tie tamper, hammers, drills, flexible ball pipe joints; W. J. Behlke, W. B. Bley, C. C. Cox, B. H. Ferguson, C. O. Jenista, W. T. Jones, L. J. Lytle, J. L. McLean, C. L. Mellor, W. B. Miller.

Bernuth, Lembcke Company, New York; elastic rail spikes, tie plate anchor spike; C. B. Bernuth, W. A. Fisher, A. C. Jack.

Buda Company, Harvey, Ill.; crossing gate, tractors, power, earth, track and bonding drills, aluminum-alloy track jack, other track jacks, bridge jack, hydraulic jacks, ball-bearing journal jack, rail bender, track liner, Diesel nozzle tester; Joe Biety, E. Broholm, C. R. Burke, H. H. Cohenour, S. T. Comfort, J. S. Dempsey, R. B. Fisher, W. A. Hart, L. O. Kerlin, R. K. Mangan, W. T. Mulcahy, R. Mulroney, K. J. Preisel, Dave Price, D. Richards, H. E. Roth, M. J. Rotroff, J. W. Sanford, G. A. Secor, C. W. Smith, R. P. Williamson, H. A. Wolfe.

C

Caterpillar Tractor Company, Peoria, Ill.; crawler tractor, hydraulic bulldozer, hydraulic control, tractor donkey and various parts; R. V. Bradley, R. B. Cartwright, Robert D. Evans, Robert Haggerty, Lyle Hill, William Hogan, B. J. Kluesing, Harold F. Miller, R. S. Pfeiffer and F. E. Schaumberg.

Chicago Pneumatic Tool Company, Chicago; air compressors, gas tampers, pneumatic tampers, spike drivers, drills, wood borers, impact wrenches and grinders, electric tools; H. G. Barbee, R. T. Beers, C. L. Butler, J. J. Brown, G. J. Coffrey, S. A. Congdon, H. R. Deubel, T. P. Harris, J. E. Hopping, J. F. Huvane, J. Kacmarik, W. Pallowick, E. S. Rosselle, G. C. Vanden Boom, L. J. Walker, F. M. Williams.

Chipman Chemical Company, Bound Brook, N. J.; literature; L. A. Elson, C. S. Langdon, N. J. Leavitt, W. H. Moyer, A. J. Reading, J. D. Ruttan.

Crerar, Adams & Co., Chicago; pipe tools, railroad crayons, taps and reamers, track tools, track and bonding drills; C. Borneman, T. J. Connelly, Geo. Dolliver, G. J. Doyle, R. Higgins, O. C. Liesendahl, H. C. White.

Cullen-Friestedt Company, Chicago; motion pictures of rail-laying cranes in action; W. C. Bamer, K. J. Beller, L. B. Bertaux, C. J. Bronez, E. V. Cullen, F. P. Cullen, C. G. Edwards, J. K. Huybers, T. G. Frazee, R. W. Jamison, F. L. Kendig, J. F. Leonard, G. G. Prest, W. J. Roehl, George Rumble, J. E. Simkins.

D

Dearborn Chemical Company, Chicago; rust preventives for structures, rust preventives and lubricant for rail joints, wrappers for pipe-line protection, feedwater treatment and test equipment, chemical proportioning equipment and pumps, blow-off and de-sludging equipment, deionizing equipment; D. B. Bishop, R. A. Carr, F. I. Chapman, E. R. Glover, E. A. Goodnow, S. C. Johnson, E. L. Konigsmark, R. H. Miller, R. Q. Milnes, R. L. Oliver, E. F. Peters, D. D. Powers, C. C. Rausch.

A. P. deSanno & Son, Inc., Phoenixville, Pa.; track-grinding wheels, wheels for shop and maintenance work; C. H. Davis, A. P. deSanno, Jr., G. E. Lipp, D. F. Madigan, Jr., E. J. Rohan.

Henry Disston & Sons, Inc., Philadelphia, Pa.; gasoline-powered chain saw, pneumatic-powered chain saw, chain-saw precision grinder; D. F. Durand, Ellwood J. Gebhart, R. H. Hoffmeister, Roland O. Lundberg, D. A. Nielsen.

Duff-Norton Manufacturing Company, Pittsburgh, Pa.; track jack, bridge jack, car jack, locomotive jacks; D. F. Evans, W. I. Floyd, Jas. Gilchrist, Jr., E. C. Gunther, George W. Hoover, G. L. Mayer, Frank Schwerin, N. A. Sinclair.

E

Eaton Manufacturing Company—Reliance Division, Massilon, Ohio; spring washers; E. D. Cowlin, S. E. Cowlin, Clifford Eisenhart, R. F. Golden, E. C. Gross, E. C. Gross, Jr., Frank Howell, A. H. Weston.

Electric Tamper & Equipment Co., Ludington, Mich.; gas and electric-driven flexible-shaft concrete vibrators, hydraulic concrete vibrator, electric vibratory screed, vibratory tie tampers, gas-electric generator sets, junction box; H. W. Cutshall, A. W. Davis, Morgan D. Hall, Glen H. Haywood, J. F. Hensel, Raymond F. Herman, Lowell Johnson, James Lydon, Warren J. Meyers, G. J. Morris, Lowell S. Osborn, Hugh D. Piper, J. M. Webb, Morton S. Westlund.

Eutectic Welding Alloys Corporation, New York; demonstration of low-temperature welding rod and flux; A. E. Bain, Wm. Bujari, Lester Dayhuff, A. O. Hazzard, J. R. Koske, A. C. Larweth, P. E. Miller, W. H. Stephenson.

F

Fabreeka Products Company, Boston, Mass.; literature and samples; A. E. Bardwell, W. P. Brennan, F. A. Hofman, R. R. Howard, George H. Marston, S. S. Maurer, W. B. Rogers, Jr., F. B. Sommers, Jr.

Fairbanks, Morse & Co., Chicago; motor cars, pumps, wheels, light plants, scales, battery chargers, electric motors, portable lights; R. D. Allen, W. F. Anderson, E. L. Benson, E. P. Chase, E. J. Cloverdale, P. Copeland, W. C. Dehn, C. T. Fugitt, E. C. Golladay, C. J. Helmholtz, H. Hilleary, D. Hopkins, J. S. King, R. F. Lane, D. K. Lee, C. J. Mahana, J. F. Marquitz, L. H. Mathews, L. F. Munson, W. L. Nies, H. G. Nagel, C. B. O'Neil, R. W. Perry, J. J. Poirier, C. A. Rauch, C. H. Reed, C. R. Turner, C. W. Turner, N. A. Sproesser.

Fairmont Railway Motors, Inc., Fairmont, Minn.; inspection, section and gang motor cars, ballast discer, weed mower, grouting outfit, derrick car, oil spray car, high-speed spot board, motor car accessories, cut-away engines; G. F. Adams, J. B. Akers, Jr., O. F. Banke, C. P. Benning, W. D. Brooks, O. F. Buscho, Kenneth Cavins, C. J. Dammann, D. D. Doolittle, C. F. Green, C. H. Johnson, W. F. Kasper, F. H. Kaup, R. H. McCune, J. T. McMahon, R. W. Payne, C. L. Rager, W. H. Ripken, F. G. Simmons, H. A. Sly, R. W. Stenzel, J. P. Wainscott, L. D. Whitaker, M. W. Williamson, W. C. Wilson.

G

General Chemical Company, New York; literature and photographs; R. H. Chipman, A. M. Dean, A. O. Feigin.

Gradall Division (Warner & Swasey Co.), Cleveland, Ohio; multi-purpose grading machine; S. F. Baetty, Jr., R. Ferwerda, G. Haritz.

H

The H. L. P. Corporation, Houston, Texas; hard-surfacing compound; W. F. Johnson, M. L. Simon.

Hayes Track Appliance Company, Richmond, Ind.; wheel stop; R. A. Downing, Roy Gabbard, S. W. Hayes, S. W. Hayes, Jr., G. O. Markey, H. J. Mayer, Paul C. McClure, M. Moore, R. C. Stiver.

Homelite Corporation, Port Chester, N. Y.; direct-current and alternating-current 60-cycle generators, 180-cycle generators, self-priming pumps, portable engine-driven blower, 60-cycle to 180-cycle frequency changer; E. W. Gramm, T. W. Gramm, L. J. Niemiec, R. P. Straetz, Nelson Thompson.

Hubbard & Co., Pittsburgh, Pa.; rail anchors, spring washers, track tools; B. F. Frazier, A. L. Fridley, J. H. Hines, N. A. Howell, A. C. Laessig.

I

Independent Pneumatic Tool Company, Chicago; pneumatic spike drivers, rock drills, impact wrenches, drills, grinders, saws, rivet busters, rivet guns, tampers and accessories; J. F. Corkery, J. A. Hill, W. A. Nugent, H. H. Ritchotte, E. B. Rosell, Ralph Schafer, F. J. Schiel, C. B. Sexton, Mark Sorenson, G. A. Thoma.

Ingersoll-Rand Company, New York; crawler-mounted compressor spot-tamper compressor, two-tool spot tamper, tie tampers, spike drivers, pneumatic tools; R. C. Baldwin, W. R. Bell, G. H. Brahler, J. Crocker, L. H. Geyer, E. L. Hawes, H. L. Kent, L. A. Luther, E. Nelson, R. E. Terry, T. H. Weigand.

Industrial Brownhoist Corporation, Bay City, Mich.; model of Diesel crane; Hoyt E. Hayes, A. P. Lyvers, Marshall A. Norby, Max Riebenack, III, C. H. White.

International Harvester Company—Industrial Power Division, Chicago; tractor and mower, crawler tractor with front-end loader; H. B. Cadmus, R. C. Flodin, W. H. Kuhlman, R. C. O'Mar, G. H. Morse, W. H. Tudor.

J

Jaeger Machine Company, Columbus, Ohio; air compressors, pumps; H. A. Kindler, Vernon G. Mandt, Ray Masters, J. T. Nolan, A. C. Thomas.

Johns-Manville Sales Corporation, New York; pipe and wall insulation, boiler lagging, roofing and siding, packings, transite smoke jacks and pipe; C. E. Bryant, Jr., G. J. Campbell, S. M. Eaton, J. I. Farrell, Fred Fix, S. H. Flannagan, J. R. Freal, J. D. Johnson, J. R. Lapp, W. G. Morehead, R. J. Offutt, Thomas O'Leary, Jr., C. M. Patten, A. C. Pickett, W. W. Proser, P. E. Redding, E. W. Reese, R. P. Townsend, John H. Trent, F. C. Vandervort, E. H. Wells, Jr.

Johnston & Jennings Co., Cleveland, Ohio; cathodic rust-proofing for steel

water-storage tanks; J. B. Clough, D. A. Hultgren, A. D. MacTaggart.

O. F. Jordan Company, East Chicago, Ind.; spreader, ditcher, snow plow; J. P. Bowers, J. J. Dudzinski, L. J. Emmerling, J. C. Forbes, H. M. McFarlane, H. Schneider, C. W. Shipley.

Joyce-Cridland Company, Dayton, Ohio; track jacks, journal jacks, air-motor jacks, automatic lowering jacks, hydraulic jacks, locomotive screw jacks; W. B. Anderson, J. H. Banks, R. E. Bell, W. S. Bowers, Paul Boyd, Houston Brown, W. F. Campbell, J. P. Gentry, Kert Hott, E. Kingsland, H. H. Landis, C. E. Munden, C. E. Murphy, H. W. Sharr, Merle P. Smith, Don W. Switzer, C. N. Thulin, E. E. Thulin, R. J. Ward, Warren E. Webster, O. L. Wright.

K

Kalamazoo Manufacturing Company, Kalamazoo, Mich.; section car, inspection car, heavy-duty car, gauge and level, A.R.E.A. track gauge, A.R.E.A. track level, steel demountable wheels; L. W. Boswell, G. E. Bridge, Stan Haigh, G. W. Hoover, R. E. Keller, Gene Larsen, G. E. Monroe, Lloyd O. Stratton, H. E. Vodell.

Kershaw Company, Montgomery, Ala.; two-ton rail derrick, cribbing machine, spike-setter carriage, off-track ballast stripper (auger-type); J. W. Davis, George T. Fritts, Knox Kershaw, Royce Kershaw.

Koehring Company, Milwaukee, Wis.; pictures of shovels, cranes, draglines and mud-jacks; J. J. Bachuber, E. J. Goes, J. E. Poulter, J. F. Robbins, J. R. Steelman, R. S. Stewart.

L

Lehon Company, Chicago; asphalt roll roofing and shingles, cold-process roofing, hot built-up asphalt roofs, waterproof felts, fabrics and papers, asphalt roof coatings, aluminum paint; C. E. Croisant, I. E. Eipper, Tom Lehon, E. A. Leonard, A. C. Senseney, John W. Shoop.

Le Roi Company, Milwaukee, Wis.; tractor-mounted compressor and trailer compressor in combination, oil-bath mower head, engine, rock drills and breakers; A. J. Bartlett, Jr., R. E. Bell, C. W. Brown, Joseph H. Callahan, G. M. Dallas, R. M. Darr, J. G. Dean, J. M. Dolan, James T. Flynn, D. E. Fricker, K. E. Gifford, F. W. Gross, Donald J. Hogan, George M. Hogan, W. H. McPhail, D. L. O'Brien, N. M. Sedgwick, S. H. Smith, C. V. Stark, L. O. Stratton, G. C. Weber.

Littleford Bros., Inc., Cincinnati, Ohio; portable crossing roller; Robert S. Arthur, Dawson Carter, L. W. Glaser.

Lundie Engineering Company, New York; tie plates, lubricator, safety tongs; L. B. Armstrong, J. P. Armstrong, William P. Joyce, Charles W. Stone.

M

Maintenance Equipment Company, Chicago; rail layer, lubricator, switch-point protector, derail; E. Overmeir, T. E. Rodman, P. A. Wells, Jr., H. V. West, Jr., P. J. Wolf.

Mall Tool Company, Chicago; portable power tools, saws, drills, vibrators, rail grinders; W. A. Blackford, Hugo Bork, T. E. Bovey, Howard Constance, Alvin O. French, Ernie Heath, Roger Howell, Einar Larson, A. W. Mall, Daniel J. O'Brien, Melvin Rehnquist, Ed Reinke, W. H. Sanders, Ralph Schwass, George A. Secor, Don Soderberg, John N. Thorp, Earl E. Thulin, Peter Walzak.

Marvel Equipment Company, Chicago; switch heaters, switch heating equipment, power plants, track liner, saw rig, mower, concrete vibrator; A. M. Anderson, J. P. Armstrong, H. F. Jorgensen, O. E. Quinton, Nelson Ruebensaal, John N. Thorp.

Master Builders Company, Cleveland, Ohio; cement dispersing agents, plasticizing agents for concrete and mortar, membrane curing compound, non-shrink mortars, metallic hardened concrete floor finishes; V. S. Andrews, C. H. Borcherding, J. Fellabaum, D. Gifford, C. A. Lyon, B. R. Wood.

Meskimen Power Sickle Mower, Chicago; power mower; L. C. Meskimen.

Modern Railroad Publishing Company, Chicago; copies of publication; Roy Gurley, Paul Jackson, Everett Meade, Frank Richter, Harold L. Stuart, D. R. Watson.

Monroe Railway Appliance Company, Tuscola, Ill.; railroad crossings, combination rail-highway roadbed; J. Christena, M. E. Lollar, Harold I. Miller, B. C. Monroe, George M. Strobridge.

Morden Frog & Crossing Works, Chicago; manganese crossing corner, rolled-steel milled frog fillers, slide plates, adjustable brace, taper rail, compromise joints; W. Homer Hartz, W. H. Hartz, Jr., G. F. Kilmer, L. I. Martin.

Morrison Railway Supply Corporation, Buffalo, N. Y.; gage holders, switch-point guard, track stabilizer, pile shoes, wood preservative; J. J. Desmond, R. L. Morrison, E. W. Smith, D. R. Vogel.

Murdock Manufacturing & Supply Co., Cincinnati, Ohio; water service devices; Thomas E. Bart, J. Kelso Murdock, Robert J. Murdock, Harold Oswald.

N

National Aluminate Corporation, Chicago; meter-controlled electrically-operated proportioner and chemical pump, vat and mixer, automatic continuous-blow equipment, panel board for control and operating circuits, specimens from research on embrittlement, display of impurities contained in locomotive water, slide film on Nalco service, display showing various phases of water treatment, waterlab for water test equipment, flow switch for controlling proportioner, literature on water treatment and service; W. R. Anthony, C. M. Bardwell, R. A. Bardwell, C. A. Brown, J. L. Callahan, E. H. Crosby, P. D. Dempsey, P. W. Evans, R. E. Falkinburg, C. B. Flint, J. L. Gibboney, L. S. Heason, R. V. Lucas, L. L. Lux, H. A. Marshall, V. E. McCoy, A. F. McNeil, E. M. Miller, R. L. Morris, H. H. Richardson, H. D. Shaw, J. J. Wagler, R. V. Zahm.

National Lock Washer Company, Newark, N. J.; lock washers; D. W. Hallberg, Eugene Harbeck, Howard Stone, G. E. Webster.

Nichols Engineering Company, Chicago; transfer tables, turntable tractors, roller-bearing turntable trucks, motor drives; B. F. Goldman, S. F. Nichols, S. H. Nichols.

Nordberg Manufacturing Company, Milwaukee, Wis.; ballast research exhibit, Ballastex, Cribex, spike puller, track gager, spike hammer, track wrench, power jack, tie adzer and bit grinder, rail drill, grinders, tension meter, saw; J. B. Akers, Jr., Dave Anderson, L. P. Brassy, George M. Cooper, George M. Dallas, J. R. Graham, Stan H. Haigh, James F. Hartley, John E. Hogan, John L. Holman, W. S. Isaacs, F. C. Jankowski, C. K. Jench, Eugene Jarson, Ralph W. Payne, H. W. Protzeller, Will H. Reaves, W. R. Reiter, John W. Sampson, Stanley H. Smith, Lloyd O. Stratton, H. H. Talboys, H. C. Wegner, J. D. Whitaker, W. C. Wilson.

Northwest Engineering Company, Chicago; photographs of railway work; H. N. Barkhausen, R. F. Cheney, R. W. Cornelisen, C. R. Dodge, J. C. French, H. P. Hahn, L. E. Houston, D. M. Peaslee, H. A. Scribner, G. C. Williams.

Northwestern Motor Company, Eau Claire, Wis.; rail grinder; Milton W. Allen, F. W. Anderson, Otis B. Duncan, F. O. Jarver, Wm. B. Joyce, C. E. Murphy, A. H. Nelson, George G. Prest, Wm. J. Roehl.

O

Oxweld Railroad Service Company, Chicago; slide film; Lem Adams, M. Burnett, Jr., W. E. Campbell, E. J. Duffie, F. C. Hasse, W. A. Hogan, R. S. Kerns, J. W. Lacey, D. H. Pittman, J. H. Rodger, R. W. Torbert, J. E. Winslow.

P

P. & M. Company, Chicago; rail anchor; S. M. Clancy, D. M. Clarke, T. C. Coleman, Jr., W. G. Cunningham, J. J. Gallagher, W. J. Garrity, P. H. Hamilton, R. D. Hawley, George E. Johnson, L. S. Johnson, John E. Mahoney, J. J. Metzger, C. J. Miller, Peter J. Moore, George E. Olson, Ralph W. Payne, F. A. Preston, W. H. Reaves, M. K. Ruppert, R. C. Schulze, L. S. Walker, F. R. Wood, Wally Wood.

Pettibone Mulliken Corporation, Chicago; forged steel adjustable rail braces, mechanical switchman, switch stands, spring frog retarder, rerailing frogs, cribbing set, dragline bucket, shoulder bolts, high-speed adjustable rail brace crossing and guard rail; J. H. Asselin, W. F. Breitzke, W. A. Enstron, Lindsay Kelley, E. C. Phillips, G. C. Slibeck, K. von Kampen, W. E. Weiss.

Philadelphia Steel & Wire Corp., Philadelphia, Pa.; spring washers; W. E. Bugbee, George M. Cooper, George M. Dallas, J. T. Flynn, James F. Hartley, D. J. Hogan, George M. Hogan, John E. Hogan, Frank J. Meyer, Stanley H. Smith, Lloyd O. Stratton, C. C. Washer.

Pittsburgh Pipe Cleaner Company, Pittsburgh, Pa.; pipe and sewer-cleaning equipment, pipe lining; Burton Dougherty, W. D. Dulac, G. N. Kleist, L. S. Lang, E. C. McFadden, T. C. Morris, H. I. Robinson, R. T. Rudder, Ray Williams.

Pocket List of Railroad Officials; New York; copies of publication; B. J. Wilson.

Power Ballaster Company, Chicago; power cribbing machine, power ballaster; George Bartz, S. E. Bates, S. E. Bates, Jr., F. H. Philbrick.

R

Racine Tool & Machine Company, Racine, Wis.; portable rail saw, bond drill, unit tie tamper, gas engine; William Carlson, George Christiansen, Ernie Clark, J. E. Erskine, M. E. Erskine, Frank Pnochaska, William Reinhardt, Jr., H. A. Schultz.

Rail Joint Company, New York; models of standard, compromise and insulated joints, insulating fiber, literature; W. J. Acker, Alex Chapman, G. M. Clodfelter, E. A. Condit, R. W. J. Harris, S. M. Harrison, H. C. Hickey, H. L. Lansing, G. H. Larson, J. N. Meade, T. I. Moore, R. W. Payne, N. H. Snyder.

Railroad Products Company, Cincinnati, Ohio; pollution-proof drinking water hydrant; Otis Duncan, D. J. Higgins, J. W. McGarry, George Prest, Ben Wickemier.

Rails Company, New Haven, Conn.; compression-type rail anchors, bridge tie anchor, switch heaters, snow melters, automatic switch point lock; R. E. Bell, R. H. Bell, L. T. Burwell, F. W. Gale, F. W. Holstein, W. A. Peck, J. V. Wescott.

Railway Maintenance Corporation, Pittsburgh, Pa.; rail-joint packing, literature, motion pictures showing the ballast mole in action; Max Bauer, John F. Casey, Jr., Carl Fester, R. M. Jenner, J. J. King, J. B. McWilliams, J. E. Mountford.

Railway Purchases & Stores, Chicago; copies of publications; J. P. Murphy, K. F. Sheeran, Edward Wray.

Railway Track-Work Company, Philadelphia, Pa.; rail grinders, track drill; Wm. D. Hoffman, John B. Moore.

Ramapo Ajax Division (American Brake Shoe Company), Chicago; switch stands, rail lubricators, tie plates, integral base crossing, gage rod, switch and stock rails and fittings, switch stand with switch-point lock; T. E. Akers, R. A. Burt, G. A. Carlson, R. L. Carmichael, E. E. Daily, J. E. Davidson, R. M. Evans, C. E. Godfrey, A. F. Hess, D. F. Hilton, J. V. Houston, A. F. Huber, J. S. Hutchins, W. P. Janicki, J. P. Kleinkort, O. F. Mangus, W. A. Maxwell, R. L. McAbee, James McComb, W. C. Muller, E. F. Needham, H. W. Renick.

Reade Manufacturing Company, Jersey City, N. J.; weed killer, model of chemical spray car, literature, samples of powdered aluminum, concrete-waterproofing and termite-proofing compounds; D. M. DeWitt, T. Moore, C. A. Parish, Chas. F. Reade, C. H. Reade, L. J. Reade, John Stalzle.

Republic Steel Corporation, Cleveland, Ohio; steel culverts, steel tunnel-lining plates, welded boiler tubing, tie plates, track bolts, track spikes, bolts and nuts, stainless steel, electric and butt-welded pipe, conduit steel sash, carbon and alloy bars, galvanized sheets; R. L. Clasen, A. Foukal, W. J. Hanna, E. B. Kelley, Howard Miller, W. F. Vosmer, T. F. West, Jr.

Reynolds Metals Company, Louisville, Ky.; aluminum sheet, shapes, building products, pigments, reflective insulating and ductwork, literature; Robert A. Borucki, Charles C. Chinske, J. F. Friebert, R. Gunter, Fred M. Lehrman, Don Revell, P. O. Robards, Edward A. Sipp, A. A. Watkins.

Ric-Wil Company, Cleveland, Ohio; insulated pipe conduit systems refrigeration pipe, steam pipe, oil pipe, hot-water pipe; W. L. Bartel, B. B. Harter, L. P. Lang, H. W. Roskilly, P. W. Stickney, W. F. Wustmann.

Rust-Oleum Corporation, Evanston, Ill.; rust-preventive paints; W. E. Bugbee, W. J. Church, W. R. Collins, Robert A. Ferguson, W. W. Fetner, W. D. Jenkins, C. E. Murphy, F. B. Nugent, R. L. Nutt, Jr., E. W. Kush, J. C. Simmons, F. M. Sweeny, John N. Thorp, Los. M. Welles.

S

Schramm, Inc., West Chester, Pa.; crawler compressor, tractor-mounted compressor, pneumatic tie tampers; G. B. Comfort, F. L. Eckert, A. N. Gustafson, G. E. Norden.

R. H. Sheppard Company, Hanover, Pa.; Diesel-powered generator sets; N. A. Frahm, J. H. Leadaman, C. W. Schaub, B. A. Seidenfeld.

Silent Hoist & Crane Co., Brooklyn, N. Y.; mobile crane for on and off track use, motion pictures, electric car puller; M. M. Botnick, Warren Fenton, F. K. Flynn, C. E. Murphy, Earl E. Thulin, R. J. Wylie.

Simmons-Boardman Publishing Corporation, Chicago; copies of publications; C. M. Burpee, M. H. Dick, R. E. Dove, W. G. Downie, S. W. Hickey, N. D. Howard, R. H. Keenleyside, C. R. Knowles, F. C. Koch, J. G. Little, H. E. McCandless, H. H. Melville, C. W. Merriken, Jr., H. E. Michael, J. M. Rockwell, F. W. Smith, F. H. Thompson, W. L. Turner, Jr., J. S. Vreeland.

Sinkler, Inc., Joseph, Chicago; pipe bender, electrode holders, pipe clamps; W. Collins, R. J. Shanahan, J. F. Leonard, J. Sinkler.

T. W. Snow Construction Company, Chicago; no exhibit; B. S. Snow.

Sperry Products, Inc., Hoboken, N. J.; model of detector car, literature on Sperry rail service, sample of defective rail; J. M. Dickey, T. E. Gilhooley, G. V. Jewell, F. P. McCarthy, C. K. Mentz, S. P. Murphy.

T

Taylor-Colquitt Company, Spartanburg, S. C.; animated diagram illustrating vapor-drying process; W. E. Gadd, D. M. Graves, John F. Renfro.

Teleweld, Inc., Chicago; literature on service for railroads; W. E. Bugbee, H. E. Finley, O. R. Hansen, C. W. McKee, H. E. McKee, E. J. Payton, W. A. Peck, J. A. Roche.

Templeton, Kenly & Co., Chicago; track jacks, rail expanders, tie spacers, track shifter, tilting-base bridge and track jack, ball-bearing bridge jack, ratchet lowering jack, utility tool, center hole hydraulic puller, hydraulic jacks; W. D. Boldt, R. B. Hill, F. L. Jakoubek, W. B. Joyce, Arthur C. Lewis, George G. Prest, W. J. Roehl, E. T. Scott, John B. Templeton.

Thornley Railway Machine Company, Joliet, Ill.; cribbing machine; LeRoy W. Hasse, F. L. McMillan, E. M. Thornley.

Timber Engineering Company, Washington, D. C.; timber connectors; R. L. Fletcher, L. P. Keith, Laurette Lohsand.

U

Unit Crane & Shovel Co., Milwaukee, Wis.; self-propelled mobile crane, crawler crane with magnet attachment; A. R. Corbett, H. O. Henwood, W. G. Larson, Jack Lumley, G. W. Mace, J. C. Novotny.

V

Vulcan Iron Works Company, Denver, Colo.; electric chain saw; A. George Setter.

W

Western Railroad Supply Company, Chicago; automatic highway crossing gate, train-speed check, testing meters, boot legs; S. Miskelly.

Winpower Manufacturing Company, Newton, Iowa; Diesel generator, gasoline generator, electric portable grinders; A. A. McArdell, T. F. Peel, Walter Sawicki.

Woodings-Verona Tool Works, Verona, Pa.; track tools, rail anchors, nut locks, triflex springs; H. W. Carr, C. K. Luyster, R. J. McComb, C. L. McKewin, J. B. Martin, J. M. Moore, W. H. Woodings.

Woolery Machine Company, Minneapolis, Minn.; tie cutter, weed burners, creosote sprayer; R. J. Moe, L. E. Woolery, W. F. Woolery.

Worthington Pump & Machinery Corp., Holyoke, Mass.; grout mixer-ejector and accessories, self priming pumps, portable air compressors, concrete mixer, tie tampers, rock drills, paving breakers; J. S. Clinger, W. H. Duffill, W. J. Fleming, H. E. Gallison, C. G. Lassen, H. W. Miller, George W. Morrow, C. F. Oeschsle, H. J. Schultz.

Background of T. P. & W. Strike

(*Continued from page 597*)

with Japan, on September 30, 1945, the government handed the T. P. & W. property back to private management. Since the latter refused to recognize the schedule of pay and working rules entered into by the federal manager and the schedule effective December 29, 1941, was automatically reinstated, the unions called for a resumption of the strike. Private management has since sought to operate the property, but with as little success as it had during the earlier phase of the strike. Local shippers adversely affected by the shutdown in service have sought in vain to have a receiver appointed to take over the road and come to some agreement with its employees.

GENERAL NEWS

Rail-Water Parley Required by I.C.C.

Grants Maritime Commission request and also assigns cases for hearing

Acting upon the motion filed recently by the United States Maritime Commission, the Interstate Commerce Commission has directed railroads and water carriers to submit proposals for adjustment of their competitive rate set-up in the form of suggested rates, "which they are prepared to defend as just and reasonable," and to "confer for mutual consideration of their proposals in accordance with the letter from the attorney general of the United States referred to in the motion of the Maritime Commission." That letter was written by Attorney General Clark in response to M. C.'s request for advice as to the applicability of the anti-trust laws to the carrier conferences it was suggesting.

As noted in the *Railway Age* of March 8, page 512, the attorney general advised in effect that no violation of the anti-trust laws would be indicated if the I. C. C. directed that the proposed conferences be held, and if they were conducted in accordance with stipulations laid down by the commission. The I. C. C. action was announced in a joint notice of March 17 in No. 29663, Transcontinental Rail Rates, No. 29664, Intercoastal Water Rates, and No. 29708, All-Water, Water-Rail, and Rail-Water Rates between Pacific Coast Ports and Interior Points. The latter proceeding was instituted by the commission by an order dated February 20 but not made public until this week.

The joint notice further announced that the three proceedings had been assigned for hearing at the Washington, D. C. office of the commission before Commissioner Alldredge and Examiners Hosmer, Colgren and McCloud. This hearing "will be for the purpose of receiving evidence from the respondents and such shippers as may be prepared to proceed at that time." Meanwhile the railroad and water carrier proposals submitted in accordance with the commission's direction and considered at the required conferences between the carriers "shall be made public for the information of interested shippers not later than April 7." The commission expressed its belief that in this manner the issues "will be clarified and the shippers better enabled to meet those issues." It added that "nothing done as a result of such a conference, however, shall bind the commission in any way." With further reference to the conferences, the I. C. C. suggested that the Maritime Commission have a representative in attendance "if it desires to participate."

It also issued special rules of procedure for the forthcoming hearings. Among other things, the rules state that petitions of intervention are unnecessary since persons appearing in opposition to the carriers' proposed rates "will be considered protestants." Parties are urged to consolidate their presentation of testimony and arrange for cross-examination and oral argument by a "limited number" of counsel. Also, evidence in the form of verified statements will be received, subject to objection after which, or upon its own motion, the commission may exclude such statements or portions thereof. "As soon as practicable" after the close of the Washington sessions, additional hearings will be assigned at other points.

McNear Will Provides Trustees for T. P. & W.

The last will and testament of George P. McNear, late president of the Toledo, Peoria & Western, designates Guy A. Gladson, a member of the legal firm of Winston, Strawn & Shaw, Chicago, and Jay T. Hunter, of Hunter, Kavanagh, McLaughlin & Bond of Peoria, Ill., as executors, and the Central Hanover Bank & Trust Co. of New York and the Wilmington Trust Company of Wilmington, Del., as trustees of his estate. His wife and children are named as principal beneficiaries thereof. One of the principal assets of the estate is Mr. McNear's controlling interest in the T. P. & W.

The executors have stated that it will be their duty and intention, if the will is admitted to probate, "to do all in their power to accomplish the full and successful resumption of operations of the railroad".

Mr. McNear's interest in the T. P. & W. is held by the Railroad Securities Corporation.

New Santa Fe Sleeper Service

Through sleeping car service between Chicago and San Diego, Cal., will be inaugurated on March 29, on the daily "Chief" of the Atchison, Topeka & Santa Fe, according to T. B. Gallaher, general passenger traffic manager. The service will be established eastbound from San Diego on April 1, and continue daily thereafter. The road also announced that it had re-established over-night sleeping car service between Albuquerque, N. M., and El Paso, Tex.

Car Service Hearing Opens Before I.C.C.

Fletcher, Clinger and Kendall testify on proposal to stiffen regulation

Testimony by V. C. Clinger, director of the Bureau of Service of the Interstate Commerce Commission, and officers of the Association of American Railroads marked the opening this week of hearings on the commission's investigation of railroad practices with respect to freight car service. Commissioners Miller, Johnson and Mitchell and Examiner Rice are conducting the proceeding, docketed as No. 29669, Car Service-Freight Cars.

$650 Million for New Cars—R. V. Fletcher, president of the A. A. R., and the first witness to testify, told the commission that "with more steel in sight for building freight cars," the railroads have enlarged their programs for new car buying to a total of 131,600 cars costing approximately $650,000,000. Judge Fletcher said that such a program would absorb all the steel available for freight car construction "until at least the middle of 1948."

"It is everywhere recognized that an important limitation upon the ability of the railroad industry to augment its supply of freight cars has been the critical shortage of steel requisite for their construction," he said, adding that the Office of Defense Transportation, the Civilian Production Administration branch of the Office of Temporary Controls, the I. C. C., and a subcommittee of the Senate committee on interstate and foreign commerce headed by Senator Reed, Republican of Kansas, have "all taken an active interest in the situation."

After reviewing the results of the recent hearings before Senator Reed's subcommittee, at which time the steel industry promised to supply sufficient steel for the construction of 10,000 cars monthly, starting in June (see *Railway Age* of March 1, page 470), Judge Fletcher said that "responses to date indicate definite plans by individual railroads which appear to assure orders for a total of 131,600 cars."

"If these plans be carried out, and I have every confidence they will be, it is apparent that the full capacity of the steel industry to supply steel for freight car construction will be booked for a period of at least more than a year to come," he said.

Clinger Wants More Power—Mr. Clinger contended that the present car service rules are "inadequate" and that the freight car situation would be improved if the I. C. C., instead of the rail-

roads, were given the authority to "promulgate and enforce" those rules. He also advocated an increase in the per diem penalty as a means of increasing the car supply.

According to Mr. Clinger, investigations made by his bureau have shown (1) that the "most acute" car shortage ever experienced now exists in the country; (2) a tendency not entirely overcome to order and hold more empty cars than necessary; (3) more car detention by industry in loading and unloading; (4) better overall terminal operations; (5) better car distribution; (6) a "general" increase in the movement of carload freight; (7) a slight decrease in the movement of less-than-carload freight; and (8) slight improvements in the "bad order" car situation. "These investigations," he continued, "have also revealed that the railroads, in most instances, certainly are not helping themselves as they should."

After listing what he described as "flagrant examples" of "unnecessary delays" to practically all types of cars on virtually every Class I road throughout the country, Mr. Clinger said that there has been no easing in the demands for box cars of all types and that the supply continues short of requirements in all areas. "The available supply is being allocated equitably as between various roads in each section of the country," he said. "Box car loadings likewise continue substantially in excess of a year ago."

Current Grain Loadings—Mr. Clinger told the commission that the northwestern district roads reported an average of 1,939 cars of bulk grain loaded daily during the week ended February 22, a daily increase of 235 cars over the previous week and 104 cars per day more than the previous year. He said that loadings of grain and grain products on all roads during the same week totaled 49,050 cars, a decrease of 2,574 cars compared with the week ended February 15 and 2,670 cars under the same week last year. He added that cumulative loadings for the eight weeks ended February 22 were 0.3 per cent over the corresponding 1946 week and 21.8 per cent over 1945.

With respect to other types of freight car equipment, Mr. Clinger stated that (1) the supply of automobile box cars and stock cars continues to be adequate; (2) the demands for gondolas are "very heavy," the supply being inadequate in the Southwest and in midwestern steel-producing areas; (3) the supply of flat cars is satisfactory, although it has been necessary to arrange for "considerable outside assistance" for the Chicago area; (4) the requirements for covered hoppers are "very heavy" for this season and are increasing; and (5) 20 roads reported deficiencies in coal car placements totaling 27,051 cars for the week ended March 1, a situation attributed to weather conditions.

Snow Slows Empties—"The Eastern and Southern district roads delivered to western connections an average of 903 empty box cars per day during the eight-day period ended February 28, which compares with 1,453 per day the previous week and 1,434 per day two weeks ago," he noted, adding that the decreased flow of empty box cars westbound was occasioned by heavy snows and adverse operating conditions.

During the course of Mr. Clinger's testimony, the commission overruled a motion by T. L. Preston, assistant general counsel of the A. A. R., to dismiss the former's statement on the basis that it was not pertinent to the hearing and that it pertained to the "efficiency or inefficiency" of individual railroads. Mr. Preston's motion brought a protest from J. S. Burchmore, general counsel of the National Industrial Traffic League.

Commissioner Johnson, who is also director of the O. D. T., interrupted the proceeding several times to emphasize that "the commission knows that a critical car shortage exists" and that it seeks to determine, as the result of its present investigation, whether or not it should be the agency to "promulgate and enforce" the car service rules in order to increase the utilization of available cars. Declaring that "we will have to construct at least 10,000 new freight cars monthly for a long time to come in order to get out of trouble," Commissioner Johnson said that the car service rules should be written and enforced so that "the most transportation can be derived from a given amount of equipment."

W. C. Kendall, chairman of the A. A. R.'s Car Service Division, presented a 39-page statement in which he asserted that the "only lasting cure" for the present car shortage is "an increase in the supply of freight cars." Mr. Kendall's testimony, in many respects, was similar to that which he gave before Senator Reed's subcommittee last month, as reported in *Railway Age*, February 22, page 421.

Kendall's Statement—"The primary objective of the car service rules . . . has been to obtain an orderly return of cars to the owning, or home, road," he said. "The principal rules affecting car movement have been and are directed to (1) the use of cars owned by the holding road; (2) cars owned by direct connections of the holding road; (3) cars owned by indirect connections of the holding road; and (4) cars handled in switching service."

Mr. Kendall observed that 2,385,582 cars were available for the movement of 405,379,284,206 tons of revenue freight one mile in 1918, as compared with 2,014,654 cars to move 591,954,000,000 tons of revenue freight one mile in 1946. "In this fact lies the explanation of current departure from the car service rules," he said. "When conditions are normal and the supply and demand for freight car equipment about balance, reasonable observance of car service rules is entirely practicable and thus cars are kept in possession of their owners in reasonable proportions, which is most desirable for an adequate maintenance program and to better satisfy needs of the shippers for whose use the cars were in the first instance provided," he stated. "But it would be wholly impossible to observe or enforce the rules at this time without sacrificing the needs of commerce to the equities of ownership."

Among other things, Mr. Kendall observed that (1) the C. S. D. has administered car distribution to meet the requirements of the commerce of the country as a whole; (2) as of March 1, box car shortages totalled 10,921 on the eastern roads and 11,213 on the western roads, as compared to 10,794 and 10,803, respectively, for the previous week; (3) 59,031 freight cars were retired by Class I roads in 1946, as compared with 41,905 in the previous year; and (4) 40,377 freight cars were installed by Class I roads in 1946, as compared with 38,987 in 1945 and 80,502 in 1941.

Supply Limits Performance—Mr. Kendall said that, in his opinion, the current performance of the railroads in extracting the maximum utility from a depleted supply of serviceable cars is, "upon the whole, excellent," despite heavy traffic in the past four or five years and the impact of wartime conditions which, he said, have brought about vast changes in the channels of movement and car location. "The problem is to make the most effective use and the most equitable distribution possible of the available supply," he said. "Unsatisfied wants inhere in a shortage, and moreover a perfect distribution is humanly unattainable."

"There is a general plan by railroads and shippers alike that the operation of the rules be restored at the earliest practicable time in the interest of an improved repair program and to bring to the railroads those ownerships which best serve their patrons," he continued. "The demands for transportation continue to be such that it is utterly impossible for the railroads to at once arrange for application of the rules in their entirety, but an attempt will be made to apply the rules by degrees and it is hoped in such a manner as will return many cars to home lines so that a reconditioning program may be set up and followed to the mutual advantage of railroad and shipper. . . . The Car Service Division is exerting every effort to maintain on western roads a more nearly adequate supply of cars to meet current requirements and we are striving to reach and maintain a goal of approximately 90 per cent of ownership on line, although somewhat lower percentages will doubtless meet the situation at certain times on certain railroads."

According to Mr. Kendall, the present inadequate car supply is due to World War

Non-Ops Ask Wage Increase

Representatives of seven non-operating railroad brotherhoods meeting in Chicago this week authorized demands for wage increases of 20 cents an hour for shop craft employees and voted to notify the railroads that they expect collective bargaining conferences to begin in 30 days. Union representatives said the wage increase is not based on increases in the cost of living but "because of inequities existing within the industry itself and because of inequities between the wages paid railroad workers and workers in similar classifications in other industries." The meeting was attended by approximately 700 union representatives.

II following upon the depression of the 1930s and the "unprecedented upsurge" in the demand for rail transportation since V-J Day. "There have been other contributing causes, such as strikes and the five-day week, but in the main the shortage is accounted for by the impact of unprecedented post-war demand upon a war-depleted car supply," he added, noting further that the five-day week in industry is resulting in the loss of "about 60 per cent" of one day's unloading per week.

Effect of Short Work Week—"Since the overall turn-around time is approximately two weeks, it may be inferred that the prevailing five-day week in industry is responsible for about one day of the turn-around time for a substantial volume of carload traffic," he said. "This loss, due to the failure of industry to make cars available by releasing on Saturday, has the added adverse effect of causing them to be idle over Sunday. There is the added load placed on yard and train forces by reason of the increased number of cars, loaded and empty, to be handled on Monday. This factor must necessarily slow up Monday operations to some extent, again a result for which the railroads are not themselves responsible."

With respect to alleged inefficient and uneconomical use of freight cars by the railroads, Mr. Kendall observed that (1) turn-around time for box cars decreased consistently throughout 1946; (2) carloadings now average "about 20,000" per week over the corresponding 1946 periods, despite a decrease in the ownership of box cars of approximately 7,600 units; (3) a total of 53,000 empty refrigerator cars were loaded with box-car traffic to Pacific coast points during the last six months of 1946; and (4) railroads have undertaken numerous "give and take" arrangements in order to promote the fullest possible utilization of the available car supply.

"There are literally hundreds of short line railroads in the country, practically all of which originate one or another general type of traffic," he continued. "Different types of cars are needed by such railroads. . . . It would constitute a problem in car handling and car distribution if each railroad were to furnish the comparatively small amount of equipment necessary for such railroad's needs. It has, therefore, in the past been the policy generally for trunk-line connections of these railroads to cooperate with the short lines and serve them out of the supply available on the trunk lines. This is a form of cooperation which is alike helpful for the trunk line and the short line."

Present Procedure Defended—Mr. Kendall said that the car service rules represent the best judgment of the railroads as to what will result in the most effective use and equitable distribution of freight cars in times of normal relationship between available equipment and the demand for rail transportation.

"I regard them as wholly reasonable," he declared. "I also regard as entirely reasonable, indeed as imperative necessary, the provisions of Per Diem Rule 19, which permits suspension of or departures from the rules. Rules designed for application under conditions of normal car supply, no matter how well adapted to those conditions, simply will not work in times of acute car shortage. Under conditions of shortage, it is imperative that some central agency, such as the Car Service Division, be authorized to direct car movement at variance with the rules.

"I think it would be unfortunate should the exigencies of the present situation prompt any change in the existing rules and arrangements regarding car service. . . . It would be wise to change the cooperative and inherently flexible operative system which we have in view of this record of performance during the varying conditions of many years. As things stand today, the commission is vested with full power to act in the premises, as conditions may require. The Car Service Division, as the agency of the railroads, has the full backing of the power residing in the commission. I believe this situation should remain undisturbed and that with continuing cooperation of all concerned and diligent effort we can carry on this record of performance."

In conclusion, he urged that "every available means of support" be given the O.D.T. and the "task force" of railroad and industrial representatives which are seeking to expedite the freight car production program.

Young and Bowman Invited to Join N. Y. C. Board

Gustav Metzman, president of the New York Central, announced on March 18 that the Chesapeake & Ohio, as the beneficial owner of 400,000 shares of New York Central stock, had requested that it be accorded representation on the board of directors of the Central. It has long been the Central's policy, Mr. Metzman said, to recognize the propriety of representation on the part of such large holdings. Therefore, Robert R. Young, chairman, and Robert J. Bowman, president, of the C. & O., have been invited to become members of the New York Central's board, subject to the necessary Interstate Commerce Commission authorization. Mr. Metzman said he had been informed that Messrs. Young and Bowman will promptly file applications with the commission to authorize them to serve as directors of the Central.

Miller Confirmed for I. C. C.

The Senate on March 17 confirmed President Truman's reappointment of Carroll Miller to the Interstate Commerce Commission for a new seven-year term ending December 31, 1953. It is his third term, since he was originally appointed in 1933 by the late President Roosevelt who subsequently reappointed him for a second term which expired at the end of last year.

President Truman submitted Mr. Miller's reappointment to the Senate on January 8, but action by the committee on interstate and foreign commerce was delayed at the request of Senator Tobey, Republican of New Hampshire, who had been unable to attend committee meetings called for consideration of the matter. Although Mr. Tobey was still absent, the committee finally acted in a March 13 executive session, voting 8-to-0 to report the nomination favorably to the Senate.

February Employment

Railroad employment decreased 0.69 per cent—from 1,334,095 to 1,324,837—during the one-month period from mid-January to mid-February, and the mid-February total was 2.97 per cent below that of February, 1946, according to the preliminary summary prepared by the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission. The index number, based on the 1935-39 average, was 133.1 for February as compared with 135.9 for the previous month and 137.3 for February, 1946.

February employment in all groups was down from the previous month, the range being from a drop of 0.05 per cent in the train and engine service group to 0.97 per cent for the maintenance of equipment and stores group. As compared with February, 1946, there were decreases in all groups except that embracing executives, officials, and staff assistants, which was up 0.21 per cent. The decreases ranged from 0.74 per cent for the train and engine service group to 6.93 per cent for maintenance of way and structures.

Alabama Plea in Georgia Case Referred to Special Master

Alabama's petition for leave to intervene in Georgia's anti-trust suit against southern and eastern railroads has been referred by the Supreme Court to its special master, Lloyd K. Garrison, who is hearing the case. The reference called for a special report at the master's "earliest convenience."

Special U. S. Chamber Report on Anti-Trust-Relief Bill

The Chamber of Commerce of the United States last week devoted a "special number" of its "Legislative Daily" to the pending Senate bill to stay the operation of anti-trust laws with respect to carrier rate-making procedures and other joint actions approved by the Interstate Commerce Commission. The bill, S. 110, sponsored by Senator Reed, Republican of Kansas, is now on the Senate calendar, having been reported recently from the committee on interstate and foreign commerce.

The chamber's statement was designed to "assist business men and business organizations in presenting the pertinent facts regarding S. 110, its background and considerations bearing on the desirability of its enactment." Among other arguments in favor of enactment, the statement calls attention to the fact that the chamber's official position, determined by a referendum last July, is as follows: "Carriers should be clearly empowered to enter into agreements as to rates or service, subject to safeguards imposed by the regulatory body, and agreements approved by that body

should be relieved from the operation of the anti-trust laws."

Precedents were found in the Shipping Act of 1916 where such relief was accorded to ocean carriers and in the Civil Aeronautics Act of 1938 where it was extended to air carriers. "Thus," the chamber continued, "rail, highway, and inland waterway carriers under the pending bill merely would be given the same opportunities for concerted action." Opponents of the bill were identified as the Department of Justice and "other non-business interests." And meanwhile "business organizations, as well as federal and state regulatory bodies, are virtually unanimous in favor of the legislation."

Bearing Industry Adopts a Standard Numbering Code

A standardized numbering system for ball and roller bearing dimensions has been presented to the American Standards Association by the Anti-Friction Bearing Manufacturers Association.

The new code calls for a common means of identifying types, sizes, tolerances, modification of internal design and lubrication of standard ball and roller bearings to meet all the requirements of users. This new semi-descriptive identification system utilizes a combination of figures and letters alternately and is described as flexible enough to take care of future changes in design, tolerances, lubricants and separator materials. It permits the expression of variable descriptions in terms of four digits.

In a bearing designation such as the code 25BC02, it was explained, the 25 indicates that the inside diameter of the bearing is 25 mm.; BC is a code designation for single row radial non-loading groove assembly; and, finally, 02 indicates the series of the bearing and its outside diameter and width. Wherever more specific information is required such as seals, cages and lubricants, code letters and numerals are added. The new numbering system is used in the industry's ball and roller bearing specification manual.

Crosser Law Affects Retirement Operations July-December

Operations under the railroad retirement system during the six-month period, July to December, 1946, inclusive, as compared with the previous half-year, showed a sharp rise in retirement annuity applications, a decline in the number of retirement annuities certified, a small rise in benefit payments and a heavy increase in tax collections, according to the current monthly review of the Railroad Retirement Board.

New annuity applications received by the board in December numbered 3,400, raising the total for the half-year to 17,450, a 15 per cent increase over the preceding six-month period. Approximately one-third of the applications, it was stated, were filed in advance and began after December under the more liberal provisions of the amended law.

New annuity applications received by totaled 11,701—22 per cent below the January-June period. Employee annuitants removed from the "in-force" rolls by death during the period numbered 6,101, leaving a total of 170,331 remaining on the rolls after adjustments. Under the program for the re-examination and readjudication of employee-annuity claims under the amendments, more than 60,000 claims had been processed by the end of December.

There were 14,707 pensioners on the rolls at the end of the six-month period, with an average monthly amount of pensions in force of $59.54. Lump-sum death benefit certifications of the old type numbered only 8,263 during the period, compared with 10,446 in the preceding half-year.

Retirement activities during December, as compared with November, showed the following: the volume of unemployment was the largest in the history of the railroad unemployment insurance operations, with 188,813 claims filed; unemployment benefit payments numbered 155,594 and amounted to $4,670,000, rising 32 per cent and 29 per cent, respectively; applications for certificates of benefit rights totaled 39,975, almost double the November figure; placements reported by the board numbered 4,734, four-fifths as many as in the preceding month.

* * *

Chicago, Burlington & Quincy Vista-Dome passenger car built by the Budd Company undergoing compression tests in the Budd structural test laboratory. End test loads exceed A.A.R. specification requirements by 50,000 lb. In addition to the full car compression testing equipment, the laboratory includes testing machines for both static and fatigue testing of single structural parts and sub-assemblies. The main horizontal testing machine has a capacity of 2,000,000 lb.

I. C. C. Revises Instructions on Signaling Applications

Revised instructions governing applications under section 25 of the Interstate Commerce Act, into which the so-called Signal Inspection Act of 1937 has been incorporated, have been issued by the Interstate Commerce Commission. They were embodied in a March 17 notice which was in effect a revision of the memorandum of instructions issued when the act was passed in 1937.

The revision is designed to bring the instructions into conformity with practices which have developed since that time. The applications involved are those for approval of discontinuance or material modifications of installations of block signal systems, interlocking, and automatic train stop, train control or cab signal devices; and those for approval of modifications or authority to depart from the signaling rules and standards prescribed by the commission in its order of April 13, 1939.

Illinois Central Issues Special 1946 Report to Employees

The Illinois Central dollar—where it comes from, where it goes—is the theme of a colorful cartoon-illustrated 24-page booklet in which W. A. Johnston, president, reports to employees the services and earnings and expenses of 1946. "We took in $215,443,216," goes the story. "We paid out $207,980,641. The $7,462,575 remaining—and more—was spent for new equipment and other additions to the property, leaving nothing from current earnings for the stockholders." In short, as the booklet puts it, "we took in a lot of money . . . but we also paid *out* a lot of money."

The service that produced these earnings is summarized as follows: "We hauled two million carloads of freight for less than a penny a ton a mile. We carried seven million passengers on through trains for about 2 cents a mile. We carried 47 million suburban passengers at 1⅛ cents a mile."

The revenue dollar was produced as

follows: 76¾ cents from freight, 14½ cents from passengers, 4 cents from express, mail, baggage, parlor car, dining car and milk traffic, 2¾ cents from switching and other operations and 2 cents from rent and other income. The outgoing dollar had 52½ cents for wages, 28¾ cents for material and equipment, 10½ cents for taxes, 4¾ cents for interest and 3½ cents for all other purposes.

February Ton-Miles

The volume of freight traffic handled by Class I railroads in February amounted to 50 billion ton-miles, an increase of 10.9 per cent above the corresponding 1946 month, according to a preliminary estimate by the Association of American Railroads.

	1946	1945	Per cent change
December	49,576,609,000	46,295,117,000	*inc.* 7.1
Year (final)	591,954,423,000	680,671,394,000	*dec.* 13.0
	1947	1946	
January	*a* 53,500,000,000	48,241,378,000	*inc.* 10.9
February	*b* 50,000,000,000	45,089,938,000	*inc.* 10.9

a Revised.
b Preliminary estimate.

The A. A. R. noted that the February, 1947, traffic was more than double that of the same month in 1939.

The accompanying table summarizes final ton-mile statistics for 1946 and preliminary figures for the first two months of 1947.

T. & P. to Offer Individual Radios for Passengers

The Texas & Pacific recently announced that it would make available new portable radios to travelers using Pullman accommodations on its "Sunshine Specials" and "Southerners" between Fort Worth, Tex., and El Paso. Purchased for what the road describes as "their clear, static-free reception on trains," the radios will be furnished for a small rental charge. Should the new service prove popular, similar type radios will be placed on the road's trains operating east of Fort Worth, according to J. H. Findley, superintendent of dining car service.

C. & N. W. 1947 Improvements to Total $106,600,000

The construction of a $1,500,000 Diesel locomotive servicing and repair shop, the purchase of 21 additional Diesel-electric locomotives and 1,400 box cars and the laying of more than 200 mi. of new 112-lb. rail for high speed traffic are among the highlights in the $106,600,000 maintenance and improvement budget of the Chicago & North Western system for 1947, R. L. Williams, president, announced last week. Mr. Williams explained that the system's budget for capital improvements and acquisition of new equipment is $39,900,000, of which amount $10,000,000 will represent additions and improvements to roadway and fixed property; $4,400,000, improvements to existing rolling stock; and $25,500,000, new equipment now on order or authorized to be placed on order. The system totals include the Chicago, St. Paul, Minneapolis & Omaha.

One of the largest C. & N. W. improvement projects planned for 1947 is the construction of a modern Diesel locomotive servicing and repair shop at the road's facilities located at Keeler and Kinzie streets in Chicago, to comprise all facilities for the servicing and repair of the increasing number of Diesels in service on the road, Mr. Williams said.

"The 1947 budget calls for acquisition of a substantial amount of new passenger and freight equipment," he explained. "Equipment which has been authorized for purchase, but not yet placed on order, consists of 21 Diesel switching locomotives and 1,400 box cars. In addition, we now have on order 78 streamlined passenger cars of which 16 are sleepers; 19 2,000-hp. and one 1,000-hp. Diesel-electric passenger locomotives; eight 4,500-hp. Diesel-electric freight locomotives; seven 1,500-hp. Diesel-eleetric freight locomotive units and 140 70-ton covered hopper cars. All this new equipment will cost approximately $25,500,000." He explained that, in addition, 500 steel hopper cars will be rebuilt by the line at its Winona (Minn.), shops, which work is already in progress.

Other major C. & N. W. projects planned for this year are as follows: the installation of centralized traffic control on the main line from West Chicago, Ill., to Nelson, at a cost of approximately $1,549,000; the laying of more than 200 mi. of 112-lb. rail; more than 216 mi. of out-of-face ballasting in high-speed traffic territory; and the installation of a number of Diesel oil and fuel oil storage tanks for Diesel and oil-burning steam locomotives. Five of these tanks will be of 150,000 gal. capacity each, two to be located at the Chicago shops, two at Council Bluffs, Iowa, and one at Beverly. The 1947 budget also provides for the construction of a modern 400-ton reinforced concrete, electrically-operated coaling plant at Clinton, Iowa.

Mr. Williams said that the use of oscillating red lights would be broadened during the year with the purchase of 196 for locomotives and 108 for use on the rear of through and suburban passenger trains.

Wood Preservers Plan 1947 Meeting in Portland

R. H. Rawson, president of the American Wood Preservers' Association, has announced that the association will hold its 1947 meeting at the Multnomah Hotel, Portland, Ore., April 22-24.

A number of government, commercial and educational authorities actively concerned with the chemical treatment of wood are slated to address the convention. These include: J. L. Muller, acting chief of the Forest Products Division, U. S. Department of Commerce; George M. Hunt, director, U. S. Forest Products Laboratory; Hal E. Hickson, head of the English wood-preserving company, Hickson & Welch, Ltd.; S. H. Ingberg, chief, Fire Resistance Section, U. S. Bureau of Standards; P. B. Proctor, head, Forest Products Department, Oregon State College; E. E. Mayo, chief engineer, Southern Pacific; H. W. Angell and W. A. McFarland, Technical Department, American Lumber & Treating Co.; J. Oscar Blew and R. H. Baechler, technicians, U. S. Forest Products Laboratory; and C. Audrey Richards, Division of Plant Pathology, U. S. Bureau of Plant Industry.

Reports will be presented by standing committees concerned with preservatives, treatment of various wood species and forest products, utilization and service of treated wood, promotion of education, publications, inspection and fireproofing. Several special committees are scheduled to report on the coordination and standardization of treatment specifications, painting of creosoted wood, treated wood blocks, preservative and fire-retardant treatment of laminated members and the handling of forest products.

In addition to the business and technical sessions, a ladies' fashion show luncheon, president's reception, visits to nearby treating plants and sawmills, a Columbia river gorge excursion and a Western party barbeque dinner dance will provide entertainment for members, ladies and guests.

A heavy attendance by members from the 11 Western states is expected. They will be host to a large delegation from the South, Middle West and East. Members in these areas have chartered a special convention train scheduled to leave Chicago April 18, and arrive in Portland April 21.

Uniform Rate Bill

Representative Bryson, Democrat of South Carolina, has introduced H. R. 2613, a bill "to require the establishment of a classification of freight and a scale of class rates, for application to transportation of property by railroad, so adjusted as not to discriminate among regions or territories in the United States."

Foundrymen to Award Medals for "Meritorious Service"

The American Foundrymen's Association, technical society of the castings industry, will award four "meritorious service" gold medals and two honorary memberships at its annual convention in Detroit, Mich., April 28 to May 1, inclusive. F. J. Walls of the International Nickel Company at Detroit, and chairman of the board of awards, announced last week.

The four medal recipients are: Russell J. Allen, metallurgical engineer of the Worthington Pump & Machinery Corp., Harrison, N. J., cited "for his earnest and unceasing contributions toward the advancement of gray iron technology;" Dr. Richard A. Flinn, metallurgist, Mahwah (N. J.) research group of the American Brake Shoe Company, named for the Peter L. Simpson medal, in recognition of "outstanding" work during the past year "in

the field of chilled and white irons;" Harry M. St. John, brass foundry and forge shop superintendent of the Crane Company, Chicago, awarded the William H. McFadden medal for "outstanding work in the field of non-ferrous castings research over a period of many years;" and Henry M. Washburn, president of the Plainville Casting Company, Plainville, Conn., and 38th president of the society, selected to receive the Joseph S. Seaman medal.

Suspends Proposed Revisions of Ex Parte 162 Increases

The Interstate Commerce Commission has suspended from March 18 until October 17 the operation of joint agency tariffs whereby the railroads proposed to revise the application of the Ex Parte 162 freight-rate increases on salt cake, ganister rock, silica rock, quartzite and quartzite rock, in carloads, and to establish a new rule to govern the application of the increases on mixed carloads of two or more commodities moving at a common rate. The commission's investigation of the suspended tariffs is docketed as I. & S. Docket No. 5471.

Ashby Recommends Biggest Spending in U. P. History

G. F. Ashby, president of the Union Pacific, declared in a recent address that he is recommending capital expenditures for improvements to road and equipment "beyond any previous recommendations in this railroad's history, in the belief that the future needs of the West and of the country as a whole will be greater than ever previously known."

The U. P. president, speaking at Cheyenne, Wyo., on the occasion of the 80th anniversary of the road's arrival in that city, said that the program included a large number of Diesel locomotives, but added that "it is not my present intention that steam locomotives will be supplanted in this coal-producing territory for many years." He stated that the road's policy would be "to keep step with advancing developments and to supply adequate transportation service to patrons of the U. P. and to encourage the further development of the natural resources—mineral, agricultural, chemical, or otherwise—of Wyoming and the mountain country."

Canadian Roads Get Big Job in Wheat Export

The Canadian Wheat Board, with the comment it is "quite apparent" the grain movement has not received its proper share of transportation during the last six months, has put in the hands of the railways the problem of moving Canadian grain to seaboard for export.

It was a problem emphasized by dwindling exports — only 1,400,000 bushels of wheat were exported during the week ended March 7 and only about 85,000,000 bushels since August 1, compared with 190,000,000 in the same period last year—by the 13 ships awaiting cargoes at Vancouver and by the decrease of stocks at the Lakehead to 6,000,000-7,000,000 bushels in excess of minimum requirements.

Noting that the Canadian government's rescinding of a priority order holding freight cars for grain transportation must not be interpreted as meaning the crisis has passed, George McIvor chairman of the board, told the railways what is needed to solve the problem.

His statement said that for the balance of the crop year ending August 1, and more particularly for the period to mid-May, wheat loadings must average 900 cars daily. Actually the board requests an increase in loadings to 1,100 cars daily until May 15 to provide stocks at Pacific Coast ports and at the lake head. The situation at the Pacific Coast could be corrected only by an immediate increase to a minimum of 250 cars daily. The railways, he said, had not met grain transportation requirements at any time during the last six months despite continuous representations by the board and the breakdown in the winter shipping program had been a great disappointment.

A. F. Whitney Solves the Car Shortage

The freight car shortage "could be quickly solved for the time being at least if railroads would streamline their handling of cars at terminals and discontinue the practice of holding for tonnage trains," according to A. F. Whitney, president of the Brotherhood of Railroad Trainmen, whose solution of this problem that has vexed railroad executives and shippers for months appears in the March 8 issue of the Brotherhood's weekly, the Trainman News.

"Undoubtedly some new equipment is needed by the carriers," Mr. Whitney conceded, but, in the words of the paper's editorial article amplifying his comment, their "blundering management," their "gross inefficiency and mishandling of the rolling stock the railroads now possess," and their "backward, wasteful methods," are "promoting a major economic disaster." "The propaganda mills of the Association of American Railroads are working overtime to convince the public that the economy's plight is due to the need for new box cars," this article concludes, "but what the country really needs is new railroad managers."

Travel Association Seeks Longer Vacation Period

A national campaign to extend vacation seasons will be launched by the officers and members of the executive committee of the National Association of Travel Officials at their mid-year conference in Duluth, Minn., March 21 and 22. The object of the program is to assure greater comfort and to stabilize costs for vacation travelers.

Garth Cate, chairman of the Year-Round-Vacation committee, announces an initial meeting of that group will be held in Chicago on March 24, following the national association conference in Duluth. The campaign to extend the vacation season already enjoys the active cooperation of the leading air, railroad, bus and hotel associations, he said. The railroads are represented on the committee by Hugh W. Siddall, chairman of the Trans-Continental Passenger Association and the Western Passenger Association, Chicago.

Would Extend Transport Study of House Committee

Chairman Wolverton of the House committee on interstate and foreign commerce has introduced House Resolution 153 to authorize the committee to continue the "national transportation inquiry" begun in 1945 under sponsorship of former Chairman Lea, Democrat of California. Presentations received by the committee in connection with the inquiry were summarized in a recent report which was noted in the *Railway Age* of January 11, page 139.

Car Service Orders

The Interstate Commerce Commission has issued Service Order No. 699 which authorizes railroads to furnish two single-deck stock cars for each 50-ft. box car ordered to transport empty containers for petroleum products in carloads from origins in Illinois, Indiana, Missouri, Kansas, Oklahoma, Arkansas or Texas to destinations in the three last-named states and New Mexico. The order became effective March 15 and will expire June 30 unless otherwise modified.

Revised Service Order No. 620, which prohibits the light-weighing of cars intended for loading with imported commodities at Atlantic, Gulf or Pacific ports, has been modified by Amendment No. 2, which provides for the issuance by the director of the commission's Bureau of Service of exemption permits "to meet exceptional circumstances."

Service Order No. 653 which maintains "super-demurrage" charges on gondola and hopper cars, has been modified by Amendment No. 4, which adds ship-bunker coal held in cars at the ports to the list of exemptions.

Committee Will Aim to Expedite Production of Freight Cars

The formation of a "task" committee, composed of representatives of the railroads, car builders, car lines and specialty and component manufacturers, which will consult with the Office of Defense Transportation and the Civilian Production Administration branch of the Office of Temporary Controls on production and procurement problems relating to the proposed increased output of freight cars, resulted from a two-day meeting held in Washington, D. C., on March 13 and 14. As noted in *Railway Age* of March 15, page 570, the meeting was called by Colonel J. Monroe Johnson, director of the O. D. T.

According to Robert L. Glenn, director of manpower and materials of the O. D. T., the freight car program is expected to result in the production of 4,000 cars in March, 5,800 in April, 7,100 in May, 9,800 in June, 10,000 in July and 9,000 in August. Mr. Glenn said the production schedules

after August would depend on the orders submitted by the railroads and the availability of the necessary materials. He added that orders for new freight cars were expected to be increased from 86,031 on March 1 to 125,000 on April 1. He also said that the meeting was described as "highly successful" by those in attendance, including Senator Reed, Republican of Kansas, who is chairman of a Senate subcommittee which has been investigating the freight car shortage. The conferees agreed that the shortage of pig iron, which has been used extensively in conjunction with the housing program, may retard the scheduled output of freight cars, Mr. Glenn further reported.

Members of the task committee include R. I. Renfrew, assistant general purchasing agent, New York Central; A. A. Taylor, assistant general purchasing agent, Missouri Pacific; L. H. Skinner, general purchasing agent, Southern; E. R. Elmore, Fruit Growers Express Company; Herbert Streader, American Car & Foundry Co.; F. B. Baker, Pullman-Standard Car Manufacturing Company; F. D. Enterline, Greenville Steel Car Company; J. R. Grever, American Steel Casting Company; C. R. Ould, American Locomotive Company; S. L. Beymer, Standard Railway Equipment Company; S. T. Mendes, W. H. Miner, Inc.; and H. W. Elkhorn, Chicago Railway Equipment Company.

Woodruff Tells Allegheny Board Financial Integrity Is Vital

There is no reason why railroads should not be treated like other public service industries and given a chance to earn a six per cent return on their invested capital, R. E. Woodruff, president of the Erie, said in Pittsburgh, Pa., on March 13 in an address before the fifty-sixth regular meeting of the Allegheny Regional Advisory Board. If this were done, he added, the railroads could raise money by issuing common stock instead of incurring debt through the issuance of bonds.

"As recently as 1942 and 1944," Mr. Woodruff said, "the Supreme Court of the United States held that earnings of 6½ per cent on the rate base of a public utility were fair and reasonable. The rates, the court pointed out, should be high enough to service debt and pay dividends and to insure sufficient confidence in the financial integrity of the enterprise so as to maintain its credit and to attract capital. In one case . . . the court approved a return of 7.4 per cent. In the face of this, what is the actual situation so far as the railroads are concerned? Under the Transportation Act of 1920 the Congress intended that the railroads should be permitted to earn 5½ per cent on property valuation, with an additional ½ per cent option. Along with this was a recapture clause which was later repealed. The Interstate Commerce Commission later decided that a return of 5¾ per cent on property valuation was desirable, but since that time the railroads have averaged less than 4 per cent. Even during the peak war year railroad earnings have been modest, averaging only 4.2 per cent after taxes."

In 1946, Mr. Woodruff continued, when the railroads handled the heaviest peacetime traffic in history, they earned only 2¾ per cent on their depreciated investment and less than 3¼ per cent on the I. C. C. valuation. The commission's Bureau of Transport Economics and Statistics in its "Monthly Comment" has stated that the 1946 rates of return for railroads in the Eastern district averaged earned 1.81 per cent on their approximate property values. If there had been no carry-back tax credits, the rate of return would have been 0.83 per cent. For all domestic railroads the reported net figure was 3.16 per cent and, eliminating carry-backs, it was 2.29 per cent.

In his talk Mr. Woodruff mentioned the dangers of government ownership, which, he said, might come through political pressure or through the bankruptcy of the railroads. In any dictatorship, or in any country turning toward nationalization, he concluded, one of the very first steps of the group in power is to take over transportation. If this is to be prevented in the United States, it will only be through an enlightened public opinion which can awaken the country to the plain fact that the obstacles confronting the development of the railroads are not simply the railroads' problem, but one in which every citizen has a vital stake.

The following officers of the Advisory Board were reelected as, respectively, general chairman, vice-general chairman, general secretary, chairman of the executive committee and vice chairman of the executive committee: F. M. Russell, traffic manager, General Fireproofing Company, Youngstown, Ohio; J. B. Keeler, manager, traffic and transportation department, Koppers Company, Pittsburgh; W. W. Larkin, traffic manager, Continental Foundry & Machinery Co., Wheeling, W. Va.; C. W. Gottschalk, general traffic manager, Jones & Laughlin Steel Corp., Pittsburgh; and W. E. Fowler, general traffic manager, Youngstown Sheet & Tube Co., Youngstown.

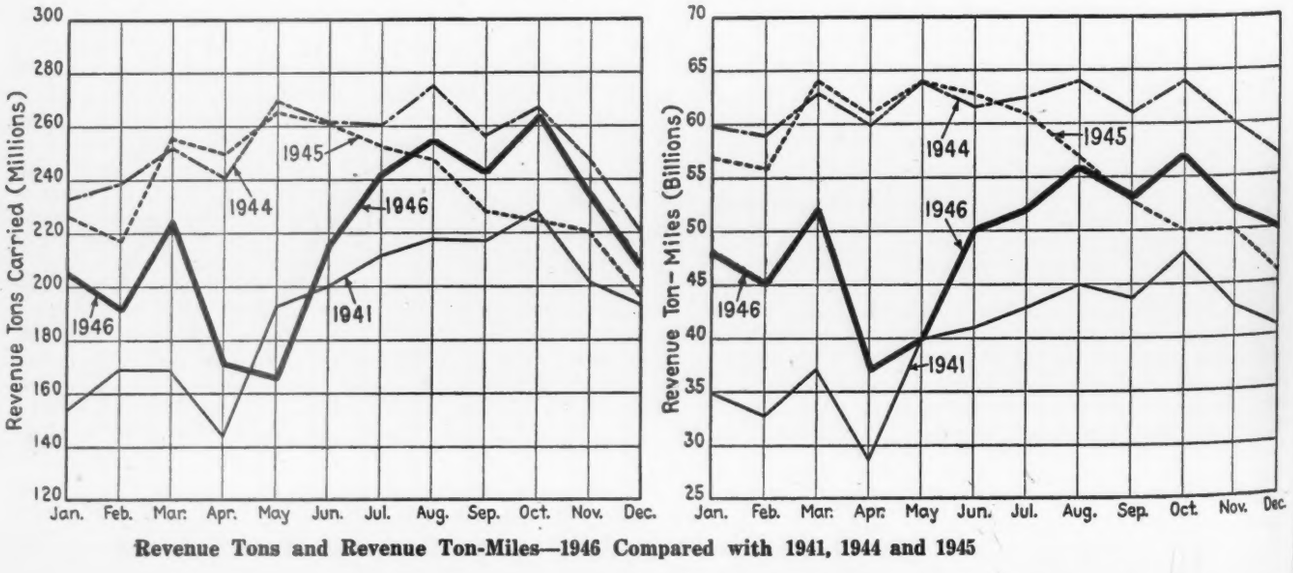
February Operating Revenues 9.1 Per Cent Above 1946

From preliminary reports of 87 Class I railroads representing 81.3 per cent of total operating revenues, the Association of American Railroads has estimated that the February gross amounted to $513,970,371, an increase of 9.1 per cent above the $471,034,566 reported for the same 1946 month. Estimated February freight revenues were $418,950,150, compared with $340,946,635, an increase of 22.9 per cent, while estimated passenger revenues were $56,794,177, compared with $93,718,023, a decrease of 39.4 per cent. The estimate for all other revenues was $38,226,044, an increase of 5.1 per cent above the $36,369,908 reported in February, 1946.

Freight Car Loadings

Loadings of revenue freight for the week ended March 15 totaled 841,147 cars, the Association of American Railroads announced on March 20. This was an increase of 35,358 cars, or 4.4 per cent, above the preceding week, an increase of 41,241 cars, or 5.2 per cent, above the corresponding week last year, and an increase of 24,591 cars, or 3.0 per cent, above the comparable 1945 week.

Loading of revenue freight for the week ended March 8 totaled 805,789 cars, and



Revenue Tons and Revenue Ton-Miles—1946 Compared with 1941, 1944 and 1945

the summary for that week as compiled by the Car Service Division, A. A. R., follows:

Revenue Freight Car Loading

For the Week Ended Saturday, March 8

District	1947	1946	1945
Eastern	155,668	152,730	152,754
Allegheny	168,511	166,119	164,953
Pocahontas	60,185	59,501	51,016
Southern	131,904	137,888	123,302
Northwestern	93,580	87,620	80,001
Central Western	130,975	120,643	122,608
Southwestern	64,966	61,688	72,421
Total Western Districts	289,521	269,951	275,030
Total All Roads	805,789	786,189	767,055
Commodities:			
Grain and grain products	51,325	47,160	40,650
Livestock	13,190	15,219	13,268
Coal	180,463	187,699	157,262
Coke	14,362	13,039	14,948
Forest products	47,115	42,035	42,436
Ore	13,011	9,819	16,555
Merchandise l.c.l.	121,534	121,756	97,810
Miscellaneous	364,789	349,462	384,126
March 8	805,789	786,189	767,055
March 1	850,031	782,397	785,736
February 22	776,689	723,281	772,396
February 15	799,977	707,054	784,703
February 8	767,481	713,240	755,832
Cumulative total, 10 weeks	8,003,415	7,319,325	7,608,933

In Canada.—Car loadings for the week ended March 8 totaled 65,561 cars, as compared to 70,306 cars for the previous week and 68,406 cars for the corresponding week last year, according to the compilation of the Dominion Bureau of Statistics.

Totals for Canada:	Revenue Cars Loaded	Total Cars Rec'd from Connections
March 8, 1947	65,561	35,582
March 9, 1947	68,406	37,012
Cumulative totals for Canada:		
March 8, 1947	669,552	359,351
March 9, 1947	651,120	344,085

Equipment on Order

Class I railroads had 75,358 new freight cars on order on March 1, as compared with 39,191 on the same day last year, according to the Association of American Railroads. Additional orders for freight cars also have been placed since March 1, the A. A. R. added.

This year's March 1 total included 23,759 hoppers, of which 2,397 were covered hoppers; 4,594 gondolas, 594 flat, 30,920 plain box, 5,042 automobile, 9,581 refrigerator, 550 stock and 318 miscellaneous freight cars.

The Class I roads also had 680 locomotives on order on March 1, compared with 463 on the same day in 1946. The former total included 45 steam, six electric and 629 Diesel-electric locomotives, compared with 85 steam, six electric and 372 Diesel-electrics a year ago.

Class I roads installed 1,437 freight cars in service in February, compared with 2,350 in the same month last year. Those installed in February included 509 hopper of which 76 were covered hoppers; 26 gondolas, 28 refrigerator, 224 automobile box, 457 plain box and 193 flat cars.

The Class I roads also put 84 new locomotives in service in February, of which 10 were steam and 74 were Diesel-electric New locomotives installed in February, 1946, totaled seven, of which six were steam and one Diesel-electric.

"Rank and File" Employees Hit "Double Crosser" Act

A group of nine resolutions directed toward the repeal of the Crosser amendments to the Railroad Retirement Act were approved and submitted to Congress last week by the Railroad Employees' Pension Protective Committee of Chicago, a group of employees representing the "rank and file" workers of 32 railroads, organized recently with the specific purpose of fighting the amendments.

The committee declared in a letter accompanying the resolutions that "rail workers, many of whom are returned war veterans in service during passage of the bill, do desire a sound, permanent, low-cost pension and unemployment plan, which excludes maternity, accident, sick or other unrelated benefit provisions."

Thomas Stack, chairman of the committee, has informed *Railway Age* that he had been "commanded" by George M. Harrison, president of the Brotherhood of Railway Clerks, to "cease activities." "He objects to me getting union men into our organization," Mr. Stack stated. "He has recited to me the laws of the brotherhood, which, he alleges, is a soverign body that cannot be wrong. He accuses me of violation of my pledges to the brotherhood in trying to defeat the lawful determined policy of his organization."

Mr. Stack declared that "when this masterpiece of confusion and misconception known in railroad circles as the 'double crosser bill' was enacted, we looked to our unions to champion our cause. Instead they took the attitude that we did not know what was good for us and indicated that we lacked the intelligence to make our own decisions."

The committee's letter to Congress asserted, among other things, that 90 per cent of railroad workers "now individually provide and do protect their families by carrying and paying for accident, health, hospitalization, fraternal, union and other forms of insurance, and consequently no railroad retirement law is necessary or should be enacted, with emphasis on maternity, sick, etc., benefits."

"With the repeal of the Crosser amendments," the letter continued, "President Truman's recommendation to the Budget Bureau for a supplemental appropriation of $2,204,000 for the Railroad Retirement Board will not be necessary. Our present funds are sufficiently ample, and by proper supervision of the board we can and will reduce the present overall cost of the bureau without impairment of service."

Conn Says Choice Is New Policy or Government Ownership

Transportation, the front line of the fortress of private enterprise in the United States, is crumbling and, under present policies, government ownership of common carriers is inevitable, Donald D. Conn, executive vice-president of the Transportation Association of America, declared in an address at Chicago on March 17. Mr. Conn, speaking before the Western Railway Club, said that the transport industry is "beset with economic dislocations due to archaic national policies and outmoded regulation, throttled by class legislation, and looted by pressure groups of self gain."

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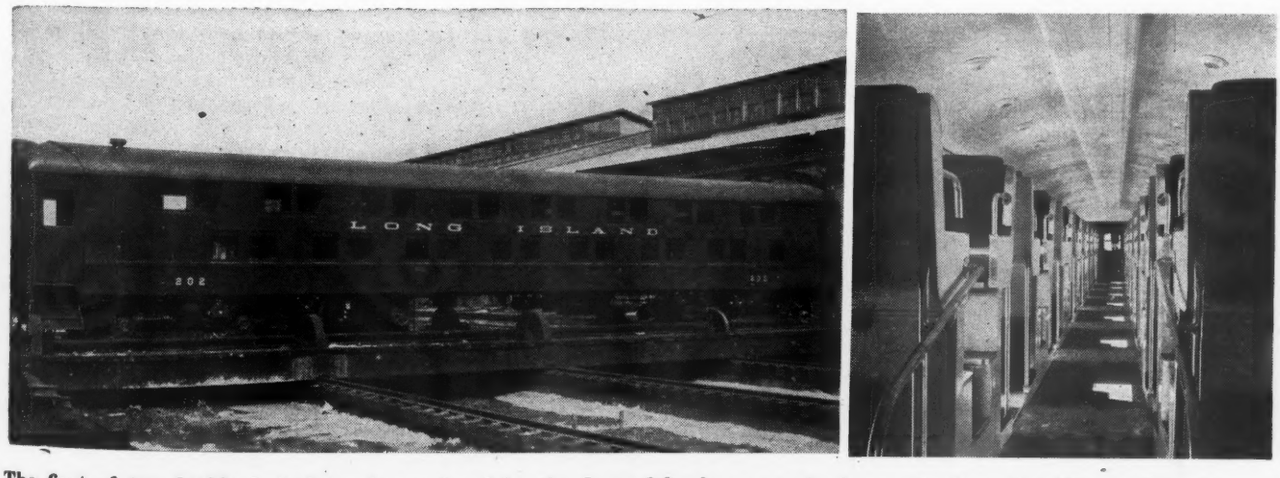


The first of ten double-decked coaches ordered by the Long Island was received recently from the Altoona, Pa., shops of the Pennsylvania. Each new car will seat 134 passengers, compared with an average of 72 in the road's standard coaches. Built completely of aluminum and about 81 feet long, the new cars are ventilated by means of a ceiling duct through which cool air is circulated during hot weather and warm air in cold weather

Selected Income and Balance-Sheet Items of Class I Steam Railways

Compiled from 129 reports (Form IBS) representing 133 steam railways
(Switching and Terminal Companies Not Included)

Income Items	All Class I Railways — For the month of December 1946	For the month of December 1945	For the twelve months of 1946	For the twelve months of 1945
1. Net railway operating income	$103,860,296	*$42,047,144	$620,150,507	$849,228,190
2. Other income	37,815,388	30,946,333	209,317,952	203,174,897
3. Total income	141,675,684	*11,100,811	829,468,459	1,052,403,087
4. Miscellaneous deductions from income	7,558,720	10,046,935	34,229,280	38,511,214
5. Income available for fixed charges	134,116,964	*21,147,746	795,239,179	1,013,891,873
6. Fixed charges:				
6-01. Rent for leased roads and equipment	14,958,015	10,207,051	124,214,433	140,086,274
6-02. Interest deductions[1]	25,502,795	36,424,266	343,557,337	380,387,187
6-03. Other deductions	252,824	260,957	1,596,378	1,494,739
6-04. Total fixed charges	40,713,634	46,892,274	469,368,148	521,968,200
7. Income after fixed charges	93,403,330	*68,040,020	325,871,031	491,923,673
8. Contingent charges	4,628,207	10,524,771	37,336,564	45,162,120
9. Net income[2]	88,775,123	*78,564,791	288,534,467	446,761,553
10. Depreciation (Way and structures and Equipment)	28,836,192	28,370,232	341,784,236	334,194,918
11. Amortization of defense projects	648,805	397,316,709	9,952,913	828,373,550
12. Federal income taxes	*69,492,422	*361,701,323	*15,604,660	304,540,973
13. Dividend appropriations:				
13-01. On common stock	22,028,959	31,041,981	175,932,457	205,007,123
13-02. On preferred stock	12,527,412	5,622,799	58,649,278	48,448,793
Ratio of income to fixed charges (Item 5÷6-04)	3.29	...	1.69	1.94

Selected Asset and Liability Items	All Class I Railways — Balance at end of December 1946	Balance at end of December 1945
17. Expenditures (gross) for additions and betterments—Road	$231,009,912	$240,139,406
18. Expenditures (gross) for additions and betterments—Equipment	318,888,544	309,759,783
19. Investments in stocks, bonds, etc., other than those of affiliated companies (Total, Account 707)	579,948,232	571,885,958
20. Other unadjusted debits	149,103,273	163,558,727
21. Cash	872,595,506	968,653,762
22. Temporary cash investments	1,103,697,479	1,588,471,446
23. Special deposits	165,831,441	190,552,960
24. Loans and bills receivable	467,833	519,934
25. Traffic and car-service balances—Dr.	45,910,590	36,837,050
26. Net balance receivable from agents and conductors	130,273,858	106,889,718
27. Miscellaneous accounts receivable	297,836,788	484,903,568
28. Materials and supplies	653,152,991	595,758,961
29. Interest and dividends receivable	22,730,007	27,227,841
30. Accrued accounts receivable	171,634,644	276,963,351
31. Other current assets	49,108,007	82,066,504
32. Total current assets (items 21 to 31)	3,513,239,144	4,358,845,095
40. Funded debt maturing within 6 months[3]	87,889,145	109,619,864
41. Loans and bills payable	9,485,000	11,104,059
42. Traffic and car-service balances—Cr.	105,609,988	152,453,321
43. Audited accounts and wages payable	470,816,978	481,523,236
44. Miscellaneous accounts payable	175,826,725	177,048,384
45. Interest matured unpaid	76,297,137	76,888,482
46. Dividends matured unpaid	15,605,486	17,374,268
47. Unmatured interest accrued	58,707,871	57,577,919
48. Unmatured dividends declared	29,569,182	27,749,617
49. Accrued accounts payable	170,519,540	224,761,382
50. Taxes accrued	391,078,418	750,823,411
51. Other current liabilities	99,844,353	126,562,946
52. Total current liabilities (items 41 to 51)	1,603,360,678	2,103,867,025
53. Analysis of taxes accrued:		
53-01. U. S. Government taxes	268,831,672	626,625,434
53-02. Other than U. S. Government taxes	122,246,746	124,197,977
54. Other unadjusted credits	368,268,403	409,753,250

[1] Represents accruals, including the amount in default.
[2] After deduction of the following amounts to create reserves for land grant deductions in dispute: December 1946, $3,717,256; December 1945, $4,816,310; 12 months of 1946, $8,407,823; 12 months of 1945, $47,333,297.
[3] Includes payments of principal of long-term debt (other than long-term debt in default) which will become due within six months after close of month of report.
* Decrease or deficit.
Compiled by the Bureau of Transport Economics and Statistics, Interstate Commerce Commission. Subject to revision.

Declaring that the economy of the United States requires a new transportation policy, Mr. Conn continued, in part: "The Transportation Act of 1920 was designed on the premise that we were dealing only with railroads. Panama Canal competition was not anticipated; no recognition was given to the probable effect of highway and air competition. The Railway Labor Act of 1926 was inspired by union labor. Shippers, who paid the freight, and private investors, who furnished the credit, were given little consideration. The Motor Carrier Act of 1935 was largely a compromise between two warring factions within the highway truck segment of common carriers. The general theme of this act was to equalize competitive opportunity between forms of common carriers rather than provide for the greatest economic use of each type of facility."

"The Civil Aeronautics Act of 1938 was developed as a national defense and promotive measure. Regulation under this law has divided the support for the security of private capital. The declaration of congressional policy in the Transportation Act of 1940 emphasized coordination, but administration of regulation has generally operated to the contrary."

The speaker, discussing the transportation situation today, said that over 30 per cent of the commercial tonnage of the United States is now transported by the producer or manufacturer for his own account. "He owns and operates trucks on the highways, private car lines on the railroads, ships on the inland waterways and the oceans, and private planes," he stated. "The function of transportation service is here an incident to manufacturing and marketing."

"All that we have accomplished in the last fifteen years is to squeeze out one set of private investors to make room for another," Mr. Conn declared. "No major step has been taken to relate the physical and financial structure of the industry as a whole to the present-day and foreseeable needs of agriculture and industry. It is time that we learned to think in terms of reorganizing the economics of transportation, thus precluding the necessity for reorganizing its balance sheets.

S. P. Drops Tariff Increasing Special-Train Minimum

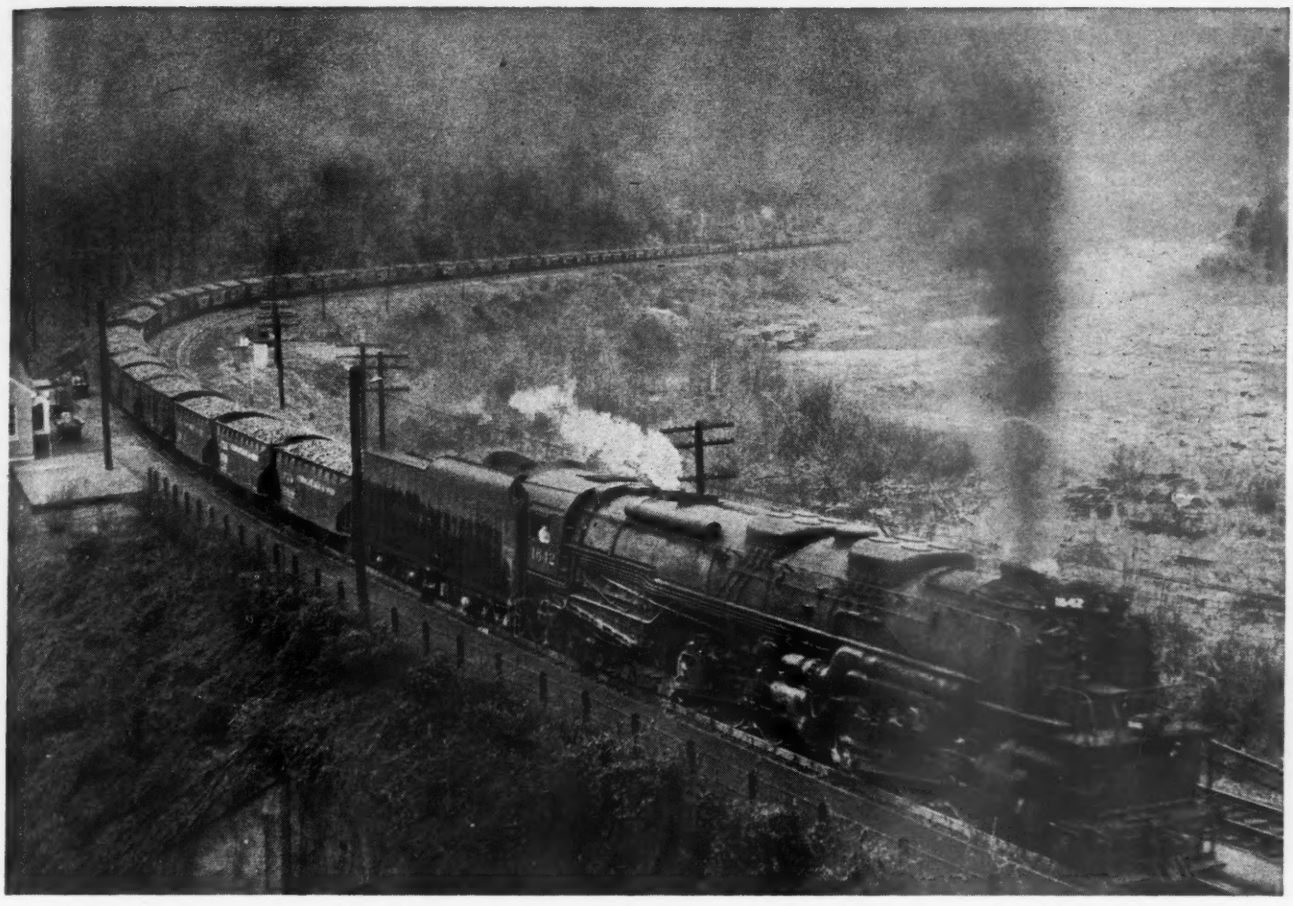
The Southern Pacific has canceled the suspended tariffs whereby it had proposed to increase the minimum requirements for the operation of special trains, for the exclusive use of special parties, from 100 to 150 adult, first-class, one-way tickets. Thus the Interstate Commerce Commission has issued an order discontinuing the I. & S. Docket No. 5453 proceeding which it instituted when it suspended the schedules from January 1 until August 1, as reported in the *Railway Age* of January 11, page 155.

Champ Carry Defends Pullman's "Packaged Car" Plan

The Pullman-Standard Car Manufacturing Company will "continue to offer our railroad customers box cars for which we will manufacture all of the component parts that our shop equipment will permit us to make economically," the company's president, Champ Carry, said in a letter made public this week. "There are many parts of the freight car," Mr. Carry continued, "that no car builder at present at least is equipped to build, such as cast steel truck side frames and bolsters, couplers, springs, draft gear, etc. It is certainly not our intention to enter any of these fields, as they are very highly specialized and entirely foreign to our present manufacturing facilities."

This comment was elicited by an article in the March 7 Cleveland News referring to what the author, Jack Cleary of that newspaper, called a "price war" among car builders in a "sellers' market" resulting in "cuts of about 15 per cent on price tags for freight cars." Pullman-Standard, according to this article, is able to make "more than 50 per cent of the parts" of box cars in its own shops, and has "decided" to do this rather than buy parts from various supply manufacturers, thereby being able, it was stated, to submit "low bids for a

News Department continued on next left-hand page



HIGH SPEED FREIGHT DEMANDS

emphasize the need for modern power

Today's freight demands can only be met through a maximum of operating efficiency . . . operating efficiency that is backed up by MODERN Motive Power, capable of hauling increased loads at higher speeds. Reduced running time means increased availability . . . and increased availability means increased revenues. Lima-built Modern Steam Locomotives have shown what Modern Steam Power can do to decrease running time and increase availability and freight revenues.

LIMA LOCOMOTIVE WORKS LIMA LOCOMOTIVE WORKS INCORPORATED **INCORPORATED, LIMA, OHIO**

standard car," and thus to "set the price pattern for the rest of the industry to meet." Bids approximate $3,600 per car as compared to $4,000 to $4,300 prevailing before the first of the year, the article said. However, it continued, "some observers" have pointed out "that the cheaper car is lighter and therefore less durable than the convention assembled car."

Mr. Carry denied this assertion, declaring that "the fact is that part for part, and in its total assembly, our low-cost car is as sound and durable as any box car that has been designed to date." Pullman-Standard, he said, is not a party to any "price war," but by "using our shop facilities to a greater degree than previously, we have been able to quote the railroads "lower prices" for cars "for which we will fabricate in our own shops many of the parts that were previously purchased from other manufacturers." This, he declared, "is not price-cutting but cost-cutting."

Subsequently, Mr. Carry made public a letter which he addressed to many railroad officers, pointing out that a statement which had been attributed to him by "a few newspapers," to the effect that Pullman-Standard had reduced the price of box cars about 15 per cent, had not been made by him. His only public statement on this subject, said Mr. Carry, was contained in his letter to Mr. Cleary of the Cleveland News. "Our low-cost box car does offer the railroads a saving," Mr. Carry concluded, "but the exact amount or percentage of saving, of course, will vary considerably, depending upon various factors with which you are familiar."

Geneva Steel Rates Become Effective April 1

The so-called Geneva steel rates will become effective April 1, the Interstate Commerce Commission having announced that it will not further suspend the tariffs which it held up for one month while it heard oral argument on the proposed adjustment. Meanwhile the investigation phase of the proceeding, I. & S. Docket No. 5464, will continue.

"After considering the protests and replies filed with it and the oral presentations made by interested parties on March 11 and 12," a March 14 notice from Secretary W. P. Bartel said, the commission "has decided that the present order of investigation and suspension shall stand as issued. This will result in an expiration of the order of suspension, March 31, 1947. The investigation of the rates involved will continue. The proceedings will be set for hearing as soon as practicable, and all concerned are advised to prepare to present their evidence at an early date."

As noted in the *Railway Age* of March 8, page 514, the rates are proposed for movements to Pacific coast destinations from Geneva, Utah, where the Geneva Steel Company, a United States Steel Corporation subsidiary, operates a steel mill formerly owned by the government. They will be 48 cents per 100 lb. to San Francisco, Calif., Los Angeles, and Portland, Ore., and 54 cents per 100 lb. to Seattle, Wash., and Tacoma—reductions of 22 cents under "normal" rates of 70 cents and 76 cents. However, the new rates will be higher by the amount of the Ex Parte 162 increases than rates accorded the government when the Geneva plant was operated for its account during the war.

Congressional Labor Committees Hear Lyon and Whitney

Appearing March 14 before the House committee on education and labor, A. E. Lyon, executive secretary of the Railway Labor Executives' Association, opposed Railway Labor Act amendments which had been recommended to the committee by A. F. Whitney, president of the Brotherhood of Railroad Trainmen. On the previous day Mr. Whitney made a presentation before the Senate committee on labor and public welfare, predicting that there would be no more national railroad strikes like that which his union and the Brotherhood of Locomotive Engineers staged last May. The Railway Labor Act amendments opposed by Mr. Lyon were recommended by Mr. Whitney in a February 25 appearance before the House committee, as reported in the *Railway Age* of March 1, page 475. Among other things, he suggested removal of the act's prohibition against the closed shop and the addition of provisions whereby dues "checkoff" arrangements would be authorized. He also proposed to make the services of emergency fact-finding boards available without the necessity for taking a strike vote.

Noting that Mr. Whitney, who is not a member of R. L. E. A., represented "but one of the numerous railroad labor organizations," Mr. Lyon identified R. L. E. A. as the representative of "twenty organizations and over 80 per cent" of the railroad employees. "We want to make it very clear," he added, "that we are proposing no amendments to the Railway Labor Act. We believe none is necessary, and we are opposed to those which Mr. Whitney suggested."

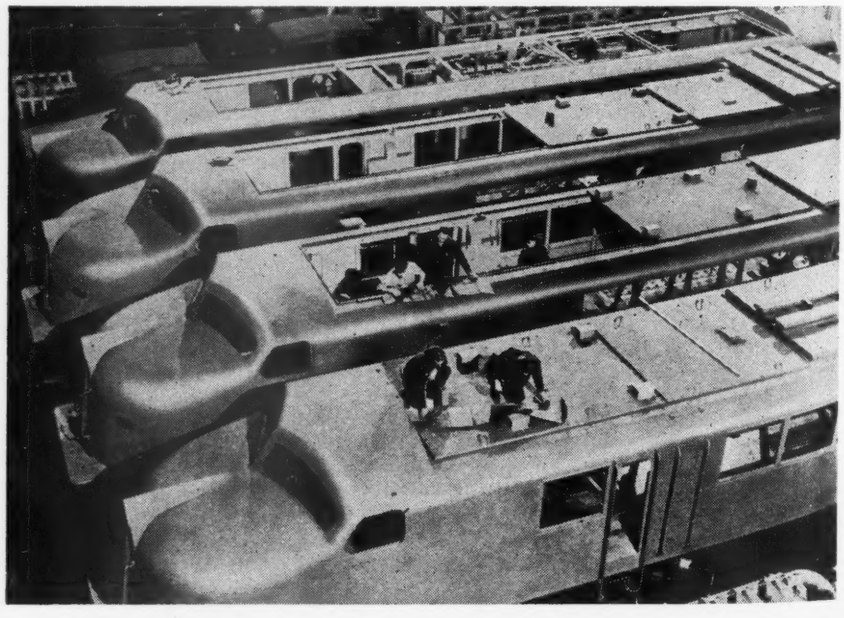
The remainder of Mr. Lyon's statement was along the line of the one he had previously made to the Senate committee, as reported in the *Railway Age* of February 22, page 426. It urged that care be taken to insure that employees and employment subject to the Railway Labor Act are exempt from provisions of any general labor legislation which the House committee may approve.

Much of the prepared statement which Mr. Whitney read to the Senate committee on March 13 was an undertaking to answer statements critical of the B. of R. T. which have been made by Wellington Roe, a former member of the brotherhood's staff who is now chairman of the "National Rank and File Association." The B. of R. T. president's prediction that there would be no more nationwide railroad strikes was brought out in questioning by committee members.

At the same time, Mr. Whitney told the committee that if management and men failed to work together the resultant impasse would be resolved only by government ownership. In the latter connection, the witness asserted that government control should be "genuine." Federal seizures of railroads in labor difficulties, he said, have thus far been "phonies," because the seized properties are operated by the same people, the earnings go to the same private owners, and the government's role is merely to "break the strike" or "retard the progress of the union."

Meanwhile, Mr. Whitney would oppose legislation making it unlawful to strike against the government, and he said there was no such thing as compulsory arbitration. As he sees it, arbitration by its nature must be free and acceptable to all

* * *



Four of an order of twelve locomotives for the Paulista Railway of Brazil, under construction in the Erie, Pa., shops of the General Electric Company. These are 182-ton, 3,000-volt d.c. electrical passenger locomotives. They have a 2-C + C-2 wheel arrangement, a continuous rating of 4,050 hp., total length of 76 ft., with a weight of 45,000 lb. on each driving axle

News Department continued on next left-hand page

From an Editorial in
RAILWAY MECHANICAL ENGINEER
—JANUARY, 1947

Steam Power Shows New Signs of Life

As 1946 passes into history and we review railroad operation for the year, we find that several interesting developments have been revealed during that year in the field of steam power.***

The operation of large 4-8-4 type locomotives with a total maintenance cost of only slightly more than 13 cents a mile over a four-year period shows definitely that the steam locomotive is not inherently expensive to maintain. Groups of steam locomotives given selected assignments and adequate servicing facilities, both en route and at terminals, average over 25,000 miles a month.***

Nor should it be forgotten that the steam locomotive of present day design can easily pack more than 5,000 drawbar horsepower in four axles and 5,000 horsepower carries a lot of weight maintaining even the fastest and most rigid of schedules.***

The steam locomotive design of today is not static. In addition to innumerable minor improvements that are being continuously made, there are two major developments that appear destined to have a marked effect on future locomotive design. Welded boilers*** The poppet valve gear may prove to be the answer to the problems of rising fuel prices and the rapid drop in horsepower that occurs in steam locomotives at high speeds. Thus it is apparent that the events of the past year, coupled with a look into the future, give a pretty strong indication that the steam locomotive will be with us for many years to come and that in the future it will give better and better service at lower and lower cost.

•

The Franklin System of Steam Distribution does prevent the rapid drop in horsepower that occurs with piston-valve locomotives. Actual test plant records show that IHP falls off less than 4% from 70 mph to 100 mph with poppet valves.

•

It is also true, however, that IHP is *also substantially increased.* The gain in drawbar pull, compared with similar piston-valve locomotives, has been as much as 24% at 60 mph and *44% at 80 mph.*

•

This greater horsepower is developed *with no increase in steam consumption.* It is produced solely by greater efficiency in converting steam into power. Therefore, at all power except maximum, there will be substantial savings in fuel and water — and, with lower steam demands on the boiler, *real reductions in boiler maintenance cost.*

•

Comprehensive test-plant data is available to show what the Franklin System of Steam Distribution can do on a modern, well-designed locomotive. With these data, and data available from other extensive tests, it is possible to calculate, with a high degree of accuracy, the increase in power and the saving in steam and fuel which can be realized with any specific locomotive design — existing or under development.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK • CHICAGO • MONTREAL

STEAM DISTRIBUTION SYSTEM • BOOSTER • RADIAL BUFFER • COMPENSATOR AND SNUBBER • POWER REVERSE GEARS
AUTOMATIC FIRE DOORS • DRIVING BOX LUBRICATORS • STEAM GRATE SHAKERS • FLEXIBLE JOINTS • CAR CONNECTION

parties involved. It was his general view that in the event of a strike it is better for the public to endure the resultant "temporary inconveniences" than to "sacrifice industrial and economic democracy."

A. S. M. E. to Hold 1947 Annual Meeting at Atlantic City

The Chalfonte and Haddon Hall, Atlantic City, N. J., will be the headquarters hotels during the annual meeting of the American Society of Mechanical Engineers December 1 to 5, inclusive. Only on two other occasions have the annual meetings of the Society been held outside New York where hotel congestion this year is expected to result from meetings of the United Nations.

"The Engineers' Responsibility in Increasing National Productivity" is the theme adopted for this year's series of A.S.M.E. meetings.

Rejects W. P. Claim that M. of W. Supervisors Are "Officials"

Rejecting Western Pacific contentions that various supervisors in its maintenance of way and structures department are "officials," the National Mediation Board has ruled that the employees involved are "subordinate officials," and has ordered an election to determine their collective-bargaining representative under provisions of the Railway Labor Act. The board's ruling came out of its investigation of a representation dispute in response to an application filed by the Association of Railroad Maintenance of Way Supervisors.

The applicant, seeking to represent "subordinate officials in the maintenance of way department," listed the following positions as being included in its application: Roadmasters, assistant roadmasters, bridge and building supervisors, assistant bridge and building supervisors, bridge inspector, signal supervisors, signal construction superintendent, and chief lineman. The W. P. took the position, as the board reported it, that every position covered by the application "has the duties of an official of the company, rather than those of a subordinate official, and, accordingly, that the National Mediation Board has no jurisdiction over any of them."

Meanwhile, the Brotherhood of Railroad Signalmen "first claimed the right to represent signal supervisors, and later made the claim that these signal supervisors are part of the craft or class of signal department employees represented by that organization, although they are not mentioned in the scope rule of their agreement with the Western Pacific." The board ruled against this contention of the brotherhood, holding that the signal supervisors "are a part of the craft or class of 'subordinate officials in the maintenance of way and structures department.'"

In deciding against the railroad's contention that the employees involved are "officials," the board said that "since no specific determination has been made by the Interstate Commerce Commission under Ex Parte 72 that the positions in question are officials, the representation desires of the employees . . . must be ascertained under the provisions of section 2, ninth, of the Railway Labor Act." Also, it referred to the recent I.C.C. decision which affirmed prior reports wherein the commission had interpreted and amended its outstanding orders defining the work of railroad employees and subordinate officials to include the work of various Union Pacific supervisors. (See *Railway Age* of March 1, page 472.)

Other recent actions of N. M. B. include its certification of election results in three representation cases, one of them being on the International Great Northern where the Order of Railway Conductors supplanted the Brotherhood of Railroad Trainmen as representative of road conductors. On the Delaware, Lackawanna & Western, the Order of Railroad Telegraphers retained its right to represent agents, telegraphers and operators, having successfully met a challenge from the United Railroad Workers of America, Congress of Industrial Organizations. The vote was 265 to 99. Marine engineers employed by the New Orleans, Texas & Mexico, who were previously without representation, have chosen the Marine Engineers' Beneficial Association.

Club Meetings

O. K. Quivey, manager of agricultural development of the Baltimore & Ohio, was elected president of the American Railway Development Association at its recent annual meeting in Dallas, Tex.

A meeting of the Car Foremen's Association has been scheduled for April 14 at the Union Station, Chicago, at 8 p. m. A paper entitled "Welding Operations on Repair Tracks" will be presented by H. E. Gannett, general welding supervisor of the Chicago, Burlington & Quincy.

A meeting of the Northwest Car Men's Association will be held on April 7 at 8 p.m. at the Midway Club, St. Paul, Minn. A paper entitled "Inspection and Carding of Empty Cars for Commodity Loading" is to be presented by G. A. Webster, car foreman of the Northern Pacific.

A meeting of the Car Foremen's Association of Omaha is scheduled for April 10, 6:30 p.m., at the Railroad Y.M.C.A. Building, Council Bluffs, Iowa.

The Canadian Railway Club has scheduled a meeting on April 14 at the Mount Royal hotel, Montreal, at 8 p.m. Mr. Leo Dolan, manager of the Canadian Travel Bureau, will be the speaker and has as his subject Canada's tourist prospects for 1947.

U. P. Reports Safety Record

The Union Pacific's mechanical department completed 5,331,000 man-hours of work in February without one reportable injury, G. F. Ashby, president, announced last week. Included in the safety record were the road's three major shops at Omaha, Neb., Cheyenne, Wyo., and Pocatello, Idaho.

The General News department is continued on page 639.

Equipment and Supplies

New P. R. R. Coaches Going into Service

The Pennsylvania has announced today that its "Trail Blazer" and "Jeffersonian" overnight coach trains between New York and Chicago and St. Louis, have now been equipped with new post-war coaches, and that work is going forward on construction of new lounge, dining, observation and special feature cars to make the trains completely new from end to end. The new coaches, which introduce automatic doors, larger lounge rooms, improved lighting and air conditioning, are also in service in the "Liberty Limited" between Washington and Chicago, and will be placed in other principal East-West overnight trains as additional cars become available.

New Haven Authorized to Spend $9.9 Million for Equipment

The New York, New Haven & Hartford has received permission from the United States district court at New Haven, Conn., to spend $9,900,000 for new equipment. Permission was granted the New Haven to purchase 10 steel multiple-unit motor passenger cars and 36 trailer passenger cars at a total cost of $3,600,000 and 1,000 steel box cars costing $3,900,000 and to rehabilitate 40 multiple-unit cars and 64 trailer cars at a cost of $2,400,000.

FREIGHT CARS

Three hundred UNION PACIFIC stock cars will be reconditioned and equipped with Timken roller bearings and steel wheels in the road's own shops at a cost of more than $300,000, G. F. Ashby, president, has announced. The cars will be placed in non-stop, Diesel-powered freight service between Salt Lake City, Utah, and Los Angeles, Calif.

"This new manifest stock service," Mr. Ashby said, "will reduce westbound schedules to about 32 hours instead of the usual 58 to 60 hours, a cut of more than 40 per cent, through elimination of a stopover at Las Vegas, Nev., for water and feed."

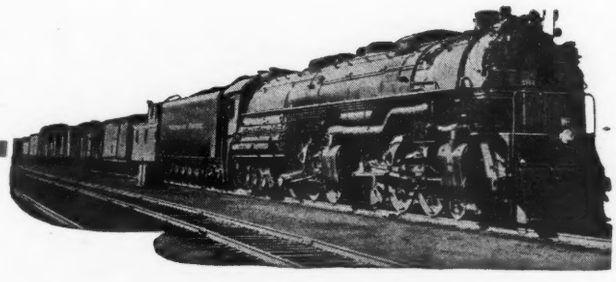
The NEW YORK, NEW HAVEN & HARTFORD has ordered 1,000 50-ton steel box cars from the Pullman-Standard Car Manufacturing Company to cost $3,900,000.

The SOUTHERN PACIFIC has ordered 500 70-ton steel flat cars from the American Car & Foundry Co. and 100 70-ton composite gondola cars for carrying sulphur from the road's own shops. The item in the March 8 *Railway Age* reporting that this road had ordered 100 gondolas from the General American Transportation Corporation was in error in that the order placed with that company was for 100 70-ton covered hoppers.

The CANADIAN NATIONAL has ordered 500 50-ton automobile cars and 1,500 50-ton box cars from the Canadian Car & Foun-

More Locomotive Mileage

through increased availability



• The installation of Security Circulators minimizes honeycombing, flue plugging and cinder cutting, so that, when circulator-equipped, an existing locomotive can operate for longer periods more efficiently.

The resulting gain in locomotive availability means that the cost of installing Security Circulators will rapidly be repaid through the increased earning power of the locomotive.

AMERICAN ARCH COMPANY, INC.

NEW YORK • CHICAGO

SECURITY CIRCULATOR DIVISION

dry Co. at Montreal, 250 50-ton ore cars, 150 70-ton covered hopper cars, and 500 50-ton box cars from the National Steel Car Company at Hamilton, Ont., and 1,700 50-ton box cars from the Eastern Car Company at New Glasgow, N. S.

The CANADIAN PACIFIC has ordered 2,500 50-ton box cars, 1,750 of which will be built by the Canadian Car & Foundry Co. and 750 by the National Steel Car Company. Orders also were placed with National Steel Car for 120 50-ton automobile cars, 100 70-ton covered hopper cars, and 325 50-ton refrigerator cars. An order for 50 cabooses was placed with the road's own shops and an order for 250 70-ton hopper cars was placed with the Eastern Car Company.

SIGNALING

The ST. LOUIS, BROWNSVILLE & MEXICO (part of the Missouri Pacific) has ordered equipment from the General Railway Signal Company for an automatic interlocking to be installed at Sinton, Tex. Nine signals will be controlled by this interlocking. A 6-ft. by 8-ft. steel bungalow, welded steel relay cases, Model 9A electric switch locks, Type K relays, Model 7 switch circuit controllers and Types D and ME signals will be used in this installation.

The HUDSON & MANHATTAN has placed orders with the Union Switch & Signal Co. for the materials involved in the modernization and consolidation of the Exchange Place interlocking, Jersey City, N. J., and the Hudson Terminal interlocking, 30 Church Street, New York City. The project involves the installation of a "UR" route-type control machine, to be located in the Hudson Terminal, which will have a 7½-ft. panel equipped with 124 track-indicating light sections and 32 spot lights, with 44 control buttons and levers. Additional materials include plug-in type relays, Style W-10 track and lighting transformers, call-on signal units, switch circuit controllers, Style C. P. electro-pneumatic switch valves, power-distribution panels, coding units, rectifiers and housings.

Supply Trade

Canadian Locomotive Built 94 Engines in 1946

The Canadian Locomotive Company built 94 locomotives during 1946 and, at the end of the year, had orders on hand for 46 locomotives, according to its annual report. Since January 1, the report indicated, orders were received for 2 steam locomotives and 19 Diesel-electric locomotives.

Operating profit for the year amounted to $2,849,108, compared with $3,438,690 in 1945. Net profit totaled $792,565, equal to $4.95 a share on 159,596 capital shares, compared with $770,668, including an excess profit tax credit of $588,800, equal to $4.83 a share on the same number of shares. Current assets at the end of the year were $2,798,457. Current liabilities were $1,690,795.

General Steel Castings Profit Over $3 Million in 1946

Net profit of the General Steel Castings Corporation in 1946 was $3,122,302, compared with $1,531,212 in the preceding year, the company's annual report shows. Current assets at the end of the year amounted to $13,810,691. Current liabilities were $3,313,812. Expenditures during the year for new buildings, machinery and equipment totaled $1,571,082. Approximately $885,000 of that amount, the report said, was for a foundry building, sand handling, molding and other equipment at the Commonwealth plant, Granite City, Ill., to provide additional facilities needed to meet the large demand for railroad passenger car trucks.

Westinghouse Electric Reports $8.8 Million Profit

Net income of the Westinghouse Electric Corporation last year was $8,823,846, compared with $26,744,055 in 1945, according to the company's annual report. Current assets at the end of the year amounted to $338,068,388, compared with $340,106,067. Current liabilities were $34,657,326, compared with $94,755,828. Long term debt was $80,000,000 compared with $20,000,000. Unfilled orders at the year-end totaled $589,583,459, the highest figure for any peacetime period and 94 per cent greater than the $303,873,749 of unfilled orders at the end of the preceding year.

Caterpillar Tractor Reports Sales of $128 Million

Sales of the Caterpillar Tractor Company totaled $128,437,494 last year, compared with $230,599,818 in 1945, according to the recently released annual report. Net profit was $6,111,591, compared with $6,511,895. Current assets at the end of the year were $76,881,349, compared with $62,722,644. Current liabilities were $13,961,943, compared with $10,606,397.

Safety Car 1946 Net $386,653

Net profit of the Safety Car Heating & Lighting Co. in 1946 was $386,653, compared with $526,254 in the preceding year, according to the annual report. Current assets at the end of the year were $6,963,058, compared with $6,921,017. Current liabilities were $1,496,111, compared with $1,266,214.

Champion Transportation Sales, Inc., Chicago, has announced its removal into larger quarters at 222 West Adams street.

Frederick H. Vogel has joined the laboratory staff of the **Timber Engineering Company,** it has been announced.

The **Carboloy Company,** Detroit, Mich., has announced the appointments of the **Mill Supplies Corporation,** 336 E. Michigan avenue, Lansing 29, Mich., as authorized distributor for Carboloy in Lansing and central Michigan, and the **Hansen & York Co.,** 86-90 Warren street, New York 7, as distributor in New York and northern New Jersey.

Gordon J. Wygant, formerly sales engineer for **Titeflex, Inc.,** Newark, N. J., has been appointed assistant sales manager of the firm.

Robert A. Neal, vice-president of the **Westinghouse Electric Corporation,** has been appointed general manager of the company's Pacific coast operations, reporting directly to the president.

Kenneth J. Weir has been appointed chief engineer of the **W-M Corporation,** 608 South Dearborn street, Chicago. He was previously supervisor of fuel and water service on the Chicago, Milwaukee, St. Paul & Pacific, at Chicago.

R. Tom Sawyer has been appointed manager of the research department of the **American Locomotive Company.** Mr. Sawyer, who has been associated with the firm since 1930, will continue to make his headquarters in New York.

Gas-turbine locomotives are a specialty of Mr. Sawyer, who also initiated research

R. Tom Sawyer

on, and the testing of, pulverized coal burning pilot plants at Alco's Dunkirk, N. Y., plant, the announcement said. In recent years, he has been active in designing and developing the new line of Diesel-electric locomotives which Alco and the General Electric Company introduced last fall. Before joining Alco, Mr. Sawyer for seven years was engineer on gasoline and Diesel-electric railroad equipment in this country and Australia for General Electric's service and engineering department. He has written "The Modern Gas Turbine" and is co-author of the recently published "Applied Atomic Power."

The **Waukesha Motor Company** has announced the following personnel changes in its railway division: **Paul W. Mantz,** formerly supervisor of the parts service department, has been transferred to field sales and service for the northern and eastern accounts and **Harold Derus,** formerly of the engineering department, has

News Department continued on next left-hand page

PROBLEM

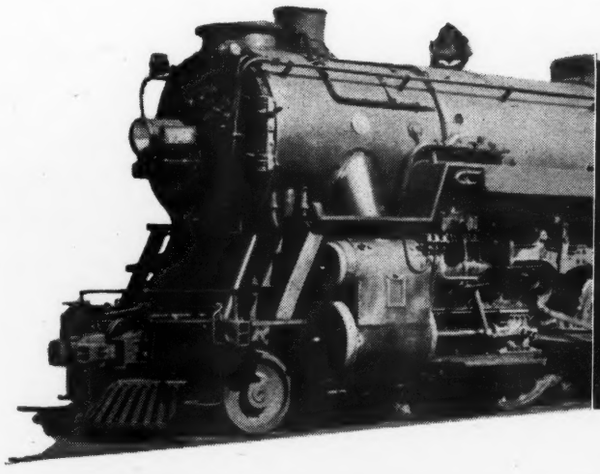
Locomotive is underboilered; costly when handling full tonnage, or trains at maximum speeds.

ONE SOLUTION

Reclaimation of heat in exhaust steam and returning it to boiler through medium of boiler water. Best means: ELESCO boiler feeding equipment.

RESULTS

Evaporative capacity of boiler is increased 20.6%. This results in an increase in power and capacity of 8% to 13%.



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been assigned to field sales and service, covering the southern and western accounts, both with headquarters at Waukesha, Wisc. **William J. Bahr,** formerly assistant supervisor of the parts service department, has been appointed supervisor of that department and **William Cultice** will coordinate field service activities in addition to his regular duties as laboratory supervisor. **F. A. Fosdal,** former field service supervisor, has resigned to enter business for himself. **M. W. Tietze,** formerly with the Harnischfeger Corporation, has been appointed electrical engineer.

The **Rust-Oleum Corporation** has announced the appointment of **Walter R. Collins,** of **Collins Oil & Manufacturing Co.,** New York, as representative to handle certain railroad accounts on the east coast. His headquarters will be at 90 West street, New York.

The **Standard Railway Equipment Company** has announced the appointments of **W. E. Bikle,** formerly of the San Francisco, Calif., office, as assistant vice-president, eastern territory, with headquarters in New York and **J. H. Schroeder,** formerly of the New York office, as manager of the San Francisco office.

The **Pittsburgh Plate Glass Company** has announced the following changes of executive personnel in its merchandising and glass sales divisions: **Richard B. Tucker** has been elected executive vice-president and **Donald C. Burnham,** formerly manager of plate glass sales, and **John A. Wilson,** formerly manager of glass manufacturing, have been elected to newly created vice-presidencies. **Wallace R. Harper,** formerly manager of the Boston, Mass., warehouse, has been appointed manager of plate glass sales to succeed Mr. Burnham and **William A. Gordon** has been appointed manager of trade sales. **Marvin W. Marshall,** manager of industrial glass sales, will assume direction of plate and safety glass sales to all production accounts and **Felix T. Hughes,** formerly assistant manager of plate glass sales, has been appointed manager of warehouse sales of plate and safety glass.

OBITUARY

W. Eckels, sales representative of the Cardwell Westinghouse Company, with headquarters at Chicago, died suddenly in Cleveland, Ohio, on March 15.

Leonard L. Solger, who had been in charge of railway sales since 1925 for the Republic Steel Corporation, with headquarters at Chicago, died at St. Joseph's Mercy hospital in Aurora, Ill., on March 3.

Harold H. Horn, western general sales manager of the Pantasote Corporation of New Jersey, with headquarters at Chicago, died suddenly at his home there on March 15.

Robert W. Schulze, western representative of the Cardwell Westinghouse Company, with headquarters at Chicago, died at Santa Ana, Cal., on March 3, following a lengthy illness.

Financial

AKRON, CANTON & YOUNGSTOWN.—*Common Stock Dividend.*—This road has declared an initial dividend of 50 cents a share on the common stock, payable on April 1 to stockholders of record on March 15.

ATCHISON, TOPEKA & SANTA FE.—*Trackage Rights.*—This road has applied to the Interstate Commerce Commission for approval of arrangements whereby it proposes to acquire trackage rights over the Denver & Rio Grande Western's 12-mile line between Portland, Colo., and Canon City, meanwhile abandoning a parallel line of its own.

BALTIMORE & OHIO.—*Equipment Trust Certificates.*—This road has requested bids by March 26 for the purchase of $5,650,000 of series T equipment trust certificates to be dated April 1, 1947. The certificates, $565,000 of which would become due each April 1 from 1948 to 1957, inclusive, are being issued to provide up to 80 per cent of the cost of 500 70-ton steel hopper cars to be built by the Pullman-Standard Car Manufacturing Company, 500 70-ton steel hopper cars to be built by the Pressed Steel Car Company and 1,000 50-ton steel hopper cars to be built by the Bethlehem Steel Company.

CENTRAL OF GEORGIA. — *Reorganization Plan Opposed.*—The Alleghany Corporation "will vote its Central of Georgia securities against [the road's reorganization plan] because it can see no reason why the owners of the property should be disenfranchised by voting trustees in whose selection they have had no voice and because it believes the security holders are entitled to more liberal distributions of cash and securities than are provided in the plan," Robert R. Young, chairman of Alleghany, said in a letter addressed to Merrill P. Callaway, trustee of the Central of Georgia. "In view of the large amounts of bonds held by Alleghany and by others who have indicated to us their attitude toward the plan, it is apparent that the plan will be voted down," the letter continued. "Having faith in the future of the Central of Georgia, Alleghany is prepared to assist in the development of a new plan that will probably recognize the investment that has been made in the property, and that will place control in its owners."

EAST ST. LOUIS JUNCTION.—*Lease.*—Modification of the lease under which this road operates the common-carrier facilities owned by its parent corporation, the St. Louis National Stockyards Company, has been authorized by Division 4 of the Interstate Commerce Commission, which at the same time approved a formula for determining taxes payable by the lessee, commencing with the calendar year 1946. Junction took over the common-carrier properties in 1940 following the commission's decision in *Status of Public Stockyard Companies,* 245 I.C.C. 241, the lease providing for rental of $1 a year and payment by the lessee of all real-estate taxes and costs of repairs on the leased properties. The division's prior report in the proceeding (Finance Docket No. 12859) deferred action on the tax payment pending completion of a valuation of the lessor's properties by the Department of Agriculture. The tax payment now approved is subject to the condition that it shall not exceed $4,500 a year. The approved modifications involve the exclusion of certain properties originally proposed to be covered by the lease.

GULF, MOBILE & OHIO. — *Trackage Rights.*—Division 4 of the Interstate Commerce Commission has authorized this road to acquire trackage rights over approximately 0.8 miles of the East St. Louis Connecting, of which the Terminal Association of St. Louis is lessee. The transaction was authorized following the receipt by the I.C.C. of written acceptance by the applicant and the Association of a condition requiring both roads to share and share alike expenses incurred by the latter in complying with the usual employee-protection conditions. (See *Railway Age* March 8, page 520.)

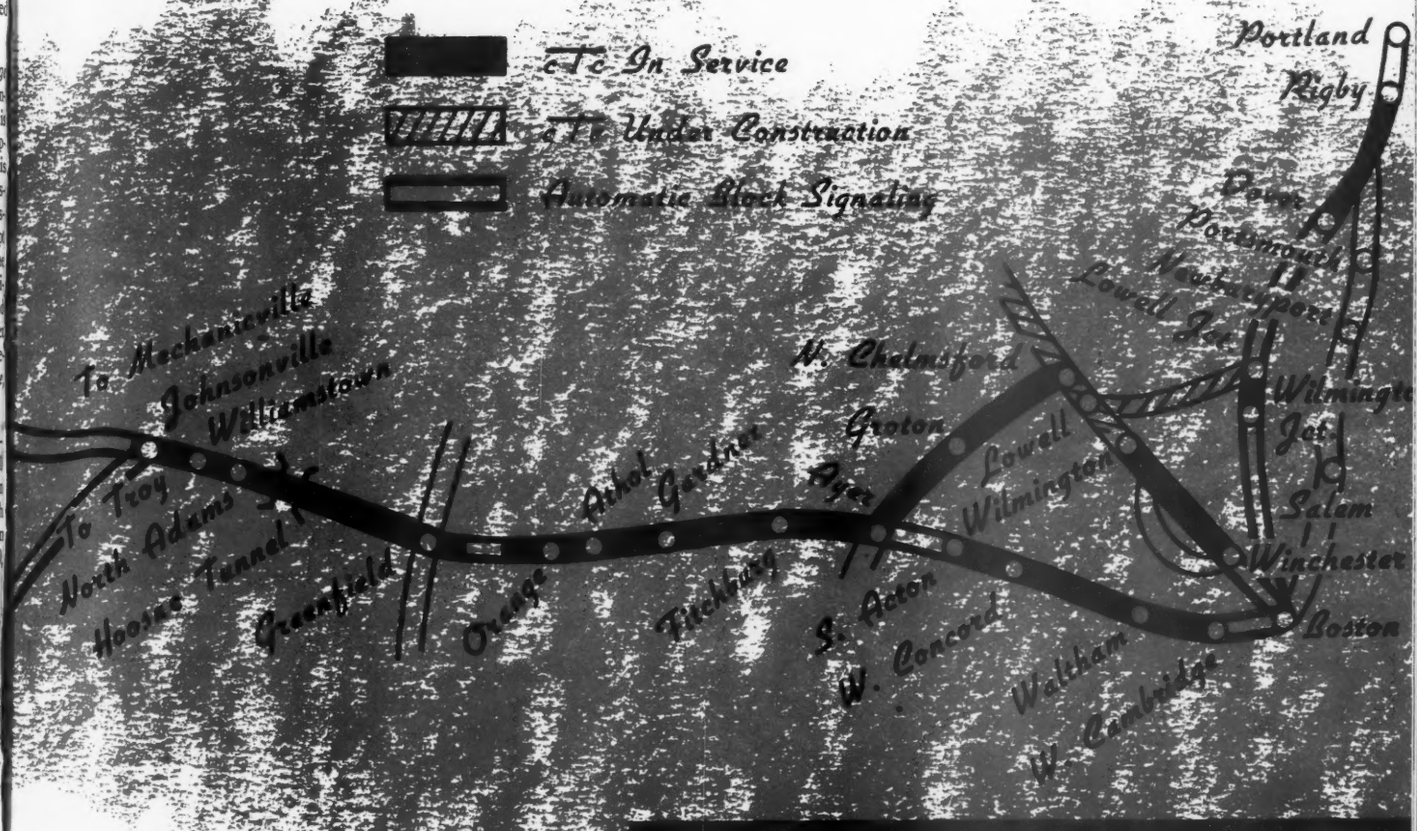
MAHONING COAL.—*Changed Dividend.*—This road has declared a dividend of $7.50 a share on the common stock, payable on April 1 to stockholders of record on March 22. The previous payment on the common stock was $6.25 a share on December 30, 1946.

NEW YORK, CHICAGO & ST. LOUIS.—*Control of W. & L. E.*—The Interstate Commerce Commission has entered, in the Finance Docket No. 15181 proceeding, an order authorizing acquisition by the Nickel Plate and, through that company, by the Chesapeake & Ohio and Alleghany Corporation, of control, through stock ownership, of the Wheeling & Lake Erie and its subsidiary, the Lorain & West Virginia. The order was accompanied by a supplemental report which announced that the parties had accepted, with modifications agreeable to the commission, the conditions attached to the prior report's approval of transactions whereby the Nickel Plate will acquire 78,145 shares of W. & L. E. common stock from the C. & O., thus building its holdings of W. & L. E. voting shares to 46.9 per cent of the total. When it issued the prior report, noted in the *Railway Age* of December 28, 1946, page 1094, the commission withheld entry of an order for 60 days, pending the parties' acceptance of the conditions.

One such condition limited the transfer price of the W. & L. E. stock to the price which the C. & O. paid for it—$4,168,388 or $53.24 per share as compared with $5,470,150 or $70 per share proposed in the application. In accepting this condition, the applicants got the commission to agree to a modification which permits the outlay for any transfer taxes incurred in transferring the shares to be added to the $4,168,388 paid to the C. & O. Another condition, requiring the maintenance of "all routes and channels of trade via existing junctions and gateways" unless and until otherwise ordered by the commission, was modified to limit its application to "presently existing" routes.

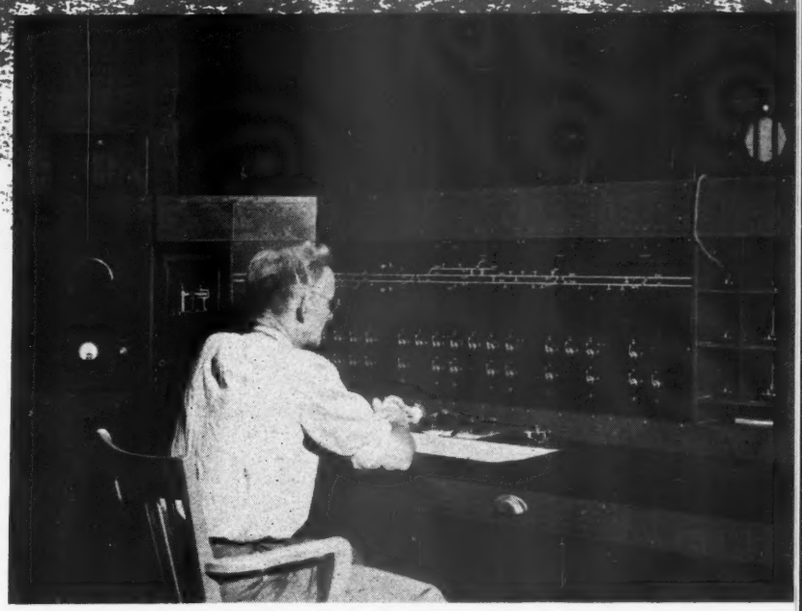
News Department is continued on the second left-hand page.

THAT COUNTS!



During the past eighteen years the B & M have added other cTc installations as shown on the map.

What cTc has accomplished for the B & M, cTc can also do for any other railroad with similar problems. Have you ever asked us for a study on your road? Write or call our nearest District Office without obligation.



GRS General Railway Signal Company

A-2187

ROCHESTER 2, N. Y. • NEW YORK 17 • CHICAGO 3 • ST. LOUIS 1

The order prepared the way for consummation of the transaction by authorizing release of the W. & L. E. common from the voting trust agreement under which it has been held since July, 1929. Also, it authorized termination of the 1929 trust agreement with a like release of W. & L. E. preferred and prior-lien stock owned by the C. & O. and Alleghany, at the same time approving C. & O. and Alleghany ownership of such shares. In the latter connection, however, another condition requires that these preferred and prior-lien shares, which are not involved in the present C. & O.-Nickel Plate transaction, must be deposited with the Chase National Bank of New York as independent voting trustee under the indenture created pursuant to the commission's 1945 decision approving Alleghany's control of the C. & O., Nickel Plate and Pere Marquette.

Other conditions impose the usual labor-protection provisions, and stipulate that the Nickel Plate "shall not exercise, singly or in conjunction with any other applicant herein or with any other person, firm, or corporation, its control of the Wheeling to cause, bring about, or in any manner result in, any redemption, retirement, or reacquisition by the Wheeling of any shares of its capital stock, except through donation, unless on our prior approval."

NORFOLK SOUTHERN.—*New Directors.*—Joseph T. Kingsley, a former special traffic representative in Washington, D. C., for several railroads, has been elected a director and chairman of the board of directors of the Norfolk Southern. Patrick B. McGinnis, senior partner in McGinnis, Bampton & Sellger, members of the New York Stock Exchange, and William T. Griffin of New York, an attorney, also have been elected directors.

PENNSYLVANIA.—*Settlement with Pennroad.*—The $15,000,000 received by the Pennroad Corporation from the Pennsylvania as a settlement of litigation involving the two companies (see the *Railway Age* for March 1), has been allocated by Pennroad as follows: $12,000,000 was added to capital surplus and $3,000,000 has been set aside until the legal fees and expenses of the suit are adjudicated. Pennroad also has announced it will continue its policy of purchasing its own shares in the open market. This policy contemplates the purchase of approximately 492,000 shares, which would reduce the company's outstanding stock to 5,000,000 shares.

RICHMOND, FREDERICKSBURG & POTOMAC.—*Notes.*—This road has applied to the Interstate Commerce Commission for authority to issue and sell $1,995,000 in notes, the proceeds of which will be applied toward the redemption of $3,000,000 of the applicant's outstanding 6 per cent non-voting stock. The notes, to bear interest at a rate to be determined by competitive bidding, will be dated April 15.

ST. LOUIS-SAN FRANCISCO. — *Trustee Discharged.*—Judge Frank A. Thompson was formally discharged as trustee of this road by an order entered in federal district court at St. Louis, Mo., on March 14. Judge Thompson was elected chairman of the board of directors of the reorganized Frisco, effective on January 1, 1947, as reported in the *Railway Age* of December 28, 1946, page 1087.

WESTERN PACIFIC. — *Loan.* — This road has requested bids by March 26 for the lowest yearly interest rate at which the bidders will provide $3,834,000 for financing, under a conditional sales agreement to be dated April 1, 1947, approximately 75 per cent of the cost of the following new equipment: 3 4,500-hp. F-3 type, Diesel-electric road locomotives, to be purchased from the Electro-Motive Division of General Motors Corporation; 2 baggage cars, 3 coaches, 9 sleeping cars, 2 coffee shop-dormitory cars, 2 dining cars and 2 observation-sleeping cars, to be purchased from the Budd Company; and 250 steel, wood-lined, 50-ton box cars, to be purchased from the Pressed Steel Car Company. The total cost of this equipment is estimated at $5,149,720.

Average Prices Stocks and Bonds

	Mar. 18	Last week	Last year
Average price of 20 representative railway stocks..	48.85	48.60	61.86
Average price of 20 representative railway bonds..	91.05	91.08	102.26

Dividends Declared

Mahoning.—$7.50, payable April 1 to holders of record March 22.

Pennsylvania.—irreg., 50¢, payable April 15 to holders of record March 22.

Pittsburgh, Bessemer & Lake Erie.—75¢, semi-annually, payable April 1 to holders of record March 15.

Providence & Worcester.—$2.50, quarterly, payable April 1 to holders of record March 17.

Savannah & Atlanta. — 5% preferred, $1.25, quarterly, payable April 1 to holders of record March 12.

Southern; M. & O. Stock Trust.—$2.00, semi-annually, payable April 1 to holders of record March 15.

Construction

DENVER & RIO GRANDE WESTERN.—This road has under construction a number of projects, totaling approximately $795,000, to be completed both by private contractors and by the road's forces. Work by private contractors, with approximate costs in parentheses, are as follows: Addition and installation of air conditioning equipment in the Rio Grande building, at Denver, Colo., Harry H. Herman ($50,608); additions to the Alamosa (Colo.) freight house, F. W Oellien ($62,792); additions to garage and office building, at Denver, Johns Engineering Company ($45,715); and removal of 24 mi. of track between Salt Lake City, Utah, and Park City, W. A. Smith Construction Company of Missouri, Kansas City, Mo. ($41,500).

Projects being completed by the road are as follows: additional trackage in the South Denver commercial district ($44,031); various line changes on the Grand Junction division, from Minturn, Colo., to Price, Utah ($68,000); retirement and construction of various trackage, and new interlocking at Salt Lake City; completed installation of automatic block signals from South Denver to Bragdon, Colo. ($56,000); installation of automatic block signals from Layton, Utah, to Roy ($32,000); installation of slide detector fences between Kremmling, Colo., and Orestod, on the Denver & Salt Lake (affiliated with the D. & R. G. W.) ($59,000); completed installation of radio equipment on cabooses and Diesel locomotives ($61,000); bridge and building and water service shop, scale shop and garage, at Salt Lake City ($38,000); addition and alteration to freight house at Salt Lake City ($46,000); changes in signal track circuits from Helper, Utah, to Thistle ($35,000); signal crossing protection at Union Pacific crossing, North Salt Lake, Utah ($22,700); new type "C" carrier telephone and printer circuit from Grand Junction, Colo., to Salt Lake City ($34,300); and rehabilitation of the Salt Lake & Utah (parts of which were recently purchased by the D. & R. G. W.) at Provo, Utah, Salt Lake City and vicinity ($100,000).

Railway Officers

EXECUTIVE

Hugh W. Stanley, chairman of the board of directors of the Tennessee Central, has been elected also president of the road, succeeding **C. E. Huntley.**

Noel R. Mitchell, secretary and industrial manager of the Akron, Canton & Youngstown, with headquarters at Akron, Ohio, has been elected vice-president—industrial. Mr. Mitchell will continue his duties as secretary of the company.

FINANCIAL, LEGAL AND ACCOUNTING

Livingston Goddard has been appointed secretary of the Federation for Railway Progress, with headquarters at New York. **J. J. Anzalone,** an alumnus of De Paul University, has been appointed treasurer of the Federation for Railway Progress, with headquarters at Cleveland, Ohio. Mr. Goddard was graduated from Yale University and Harvard Law School. Upon graduation from the latter in 1935, he was appointed assistant district attorney of New York county, N. Y., and in 1941 he joined the civilian staff of Operations Analysis Section, United States Army Air Forces, where he was deputy chief with the 21st Bomber Command on Guam.

OPERATING

Henry W. Sweet has been appointed general manager, Terminal Railway, Alabama state docks, with headquarters at Mobile, Ala., succeeding **C. E. Sauls.**

H. L. Woldridge, division engineer of the Northern division of the St. Louis-San

Francisco, at Fort Scott, Kan., has been appointed assistant superintendent, with headquarters at Joplin, Mo., in charge of the Afton sub-division, part of the Carthage sub-division, and part of the Parsons sub-division, succeeding **H. E. Rook,** transferred.

L. W. Cartwright, trainmaster of the Beach division of the Norfolk Southern, has been transferred to the Steam division, with headquarters at Carolina yard, Norfolk, Va.

E. E. Schlottman, trainmaster of the Illinois Central, with headquarters at Jackson, Tenn., has been promoted to division superintendent, with headquarters at Vicksburg, Miss., succeeding **J. F. Sharkey,** who has been transferred to Carbondale, Ill. Mr. Sharkey has relieved **J. McEwen,** who has been granted a leave of absence due to ill health. Mr. Schlottman has been succeeded at Jackson by **E. H. Buelow,** trainmaster at Grenada, Miss., who in turn has been relieved by **H. L. Williams.**

Albert St. Clair, assistant superintendent of the Knoxville division of the Southern at Knoxville, Tenn., has been promoted to superintendent of the Appalachia division at Bristol, Va., succeeding **Spates S. Brooks,** who has retired. **Lonnie I. McNutt,** trainmaster at Louisville, Ky., has been promoted to assistant superintendent at Knoxville, to succeed Mr. St. Clair. Mr. Brooks was born on August 1, 1886, at Knoxville and attended Maryville College and the University of Tennessee. He entered the employ of the Southern in September, 1901, as a telegrapher at Alpha, Tenn. In 1907 he was appointed dispatcher at Knoxville and served there subsequently as chief dispatcher, trainmaster and superintendent. He was transferred to Bristol in 1926 and subsequently to Asheville, N. C., Alexandria, Va., and Greensboro, N. C. In April, 1938, he was appointed general superintendent transportation at Knoxville and in March, 1946, returned to Bristol as superintendent.

J. Garland Woodall, trainmaster of the Southern, with headquarters at Birmingham, Ala., has been promoted to superintendent of terminals there, succeeding **David C. Ferguson,** who has been transferred to Knoxville, Tenn. Mr. Woodall is succeeded by **Edwin E. Brown. Leslie Woodall, Jr.,** trainmaster at Oakdale, Tenn., has been transferred to Louisville, Ky., where he succeeds **Lonnie I. McNutt. James G. Beard** has been appointed trainmaster at Oakdale. Mr. Ferguson succeeds **John M. Clark,** who has retired after almost 45 years of service. Mr. Clark was born on May 26, 1887, at Bristol, Va., and attended public schools there. He entered the service of the Southern in 1902 as a switch light tender at Knoxville, serving subsequently as switch liner, hostler helper and switchman. In November, 1906, he was promoted to yardmaster and in October, 1925, he was appointed terminal trainmaster. He was promoted to superintendent terminals at Knoxville on January 1, 1943, the position he held until his retirement.

TRAFFIC

Richard P. Theile has been appointed general agent of the Illinois Central, with headquarters at Tulsa, Okla.

G. Swift Williams, commercial agent of the Seaboard Air Line at Jacksonville, Fla., has been promoted to division freight agent, with headquarters at Birmingham, Ala.

J. J. O'Connor, commercial agent of the Clinchfield, with headquarters at Detroit, Mich., has been promoted to district freight agent there, succeeding **H. O. Yant,** who died recently.

Walter F. Smith, assistant general freight agent—solicitation, of the Chicago, Indianapolis & Louisville, has been promoted to general freight agent—sales and service, with headquarters as before at Chicago.

Frank W. Oslie has been appointed district passenger agent of the Louisville & Nashville, at Detroit, Mich., and **Tyndall Ball** has been appointed division passenger agent at Cincinnati, Ohio, succeeding **H. E. Porter,** who died recently.

G. A. Erickson, district freight agent of the Southern Pacific, with headquarters at San Francisco, Cal., has been appointed industrial agent there. He is succeeded by **Willard Barr,** district freight agent at Oakland, Cal., who in turn is succeeded by **C. H. Reeves,** district freight agent at Sacramento, Cal. Mr. Reeves is succeeded by **H. E. Hinshaw,** district freight agent at San Jose, Cal. **J. T. McCann** has been appointed district freight agent at San Jose, and **W. S. Wood** has been appointed district freight and passenger agent at Salinas, Cal.

MECHANICAL

J. E. Wightman, assistant to works manager of the Pennsylvania at Altoona, Pa., has been appointed acting master mechanic, Indianapolis and St. Louis divisions, with headquarters at Indianapolis, Ind.

Harold F. Mackey, assistant supervisor of Diesel engines of the Atchison, Topeka & Santa Fe, with headquarters at Los Angeles, Cal., has been promoted to supervisor of Diesel engines at Chicago. He succeeds **Thomas T. Blickle,** whose appointment as master mechanic at Dodge City, Kan., was reported in the *Railway Age* of March 8.

ENGINEERING & SIGNALING

C. Neufeld, assistant engineer of the Canadian Pacific, has been appointed assistant engineer of bridges, with headquarters at Montreal, Que.

J. F. Shaffer, office engineer of the Missouri-Kansas-Texas, has been appointed principal assistant engineer, with headquarters at St. Louis, Mo.

P. J. Schmitz, division roadmaster on the St. Louis-San Francisco, at Amory, Miss., has been appointed division engineer of the Northern division, with headquarters at Fort Scott, Kan., succeeding **H. L. Woldridge,** who has been appointed assistant superintendent at Joplin, Mo.

I. A. Moore, trainmaster of the Chicago & Eastern Illinois, at Salem, Ill., has been appointed senior assistant engineer, with headquarters at Danville, Ill.

C. F. Burrell, engineer maintenance of way of the Kentucky & Indiana Terminal, at Louisville, Ky., has been appointed chief engineer, with the same headquarters.

W. K. Waltz has been appointed signal engineer of the Elgin, Joliet & Eastern, with headquarters at Joliet, Ill.

F. T. Miller, consulting engineer of the Atlantic & Yadkin, has been appointed chief engineer, with headquarters at Greensboro, N. C.

PURCHASES AND STORES

J. H. F. Morgan, district storekeeper of the Canadian National, with headquarters at Port Mann, B. C., has retired.

OBITUARY

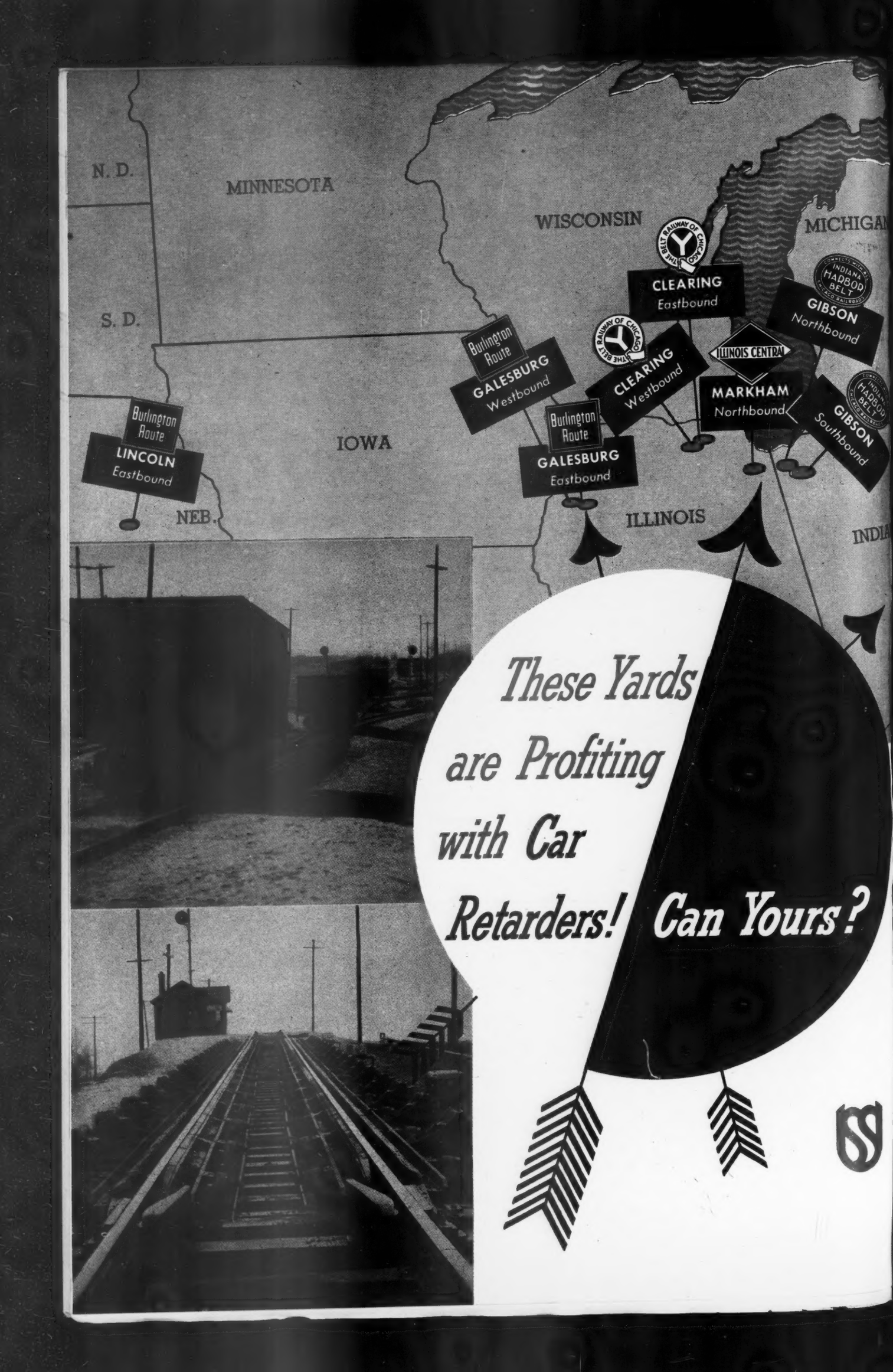
George H. Herrnecker, retired division engineer of the Susquehanna division of the Erie, died recently at Hornell, N. Y.

W. Gilbert, chief inspector, water supply, of the Chesapeake & Ohio, with headquarters at Richmond, Va., died in that city on March 11.

Henry S. Bischoff, general agent, freight department of the Chicago & North Western, at Chicago, died suddenly at his home in Oak Park, Ill., on March 11.

Francis J. Pflaum, assistant to the general passenger traffic manager of the Union Pacific, with headquarters at Omaha, Neb., died recently at his home in that city following a heart attack.

Frederick W. Brown, vice-president—operation of the Atlantic Coast Line, with headquarters at Wilmington, N. C., died of pneumonia at James Walker Memorial hospital, Wilmington, on March 14, at the age of 75. Mr. Brown was born on February 17, 1872, at New Canaan, Conn., and entered railroad service on June 1, 1887, as freight clerk for the New York, New Haven & Hartford. He then served as operator, clerk and dispatcher, successively, for the Housatonic (now New Haven); chief dispatcher and trainmaster on New Haven branch lines; dispatcher on the New Haven main line; chief clerk in the operating department and assistant superintendent on the New Haven. In 1906 Mr. Brown went with the Southern where he served as dispatcher, trainmaster, superintendent of terminal, division superintendent, chief of tonnage bureau, assistant to general manager and assistant to vice-president Going with the Atlantic Coast Line in March, 1920, Mr. Brown served successively as assistant to general manager, assistant general manager, director of transportation, general manager and vice-president and general manager. He became vice-president—operation in May, 1942, the position he held until his death.


N. D.
MINNESOTA
S. D.
IOWA
NEB.
WISCONSIN
ILLINOIS
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Burlington Route
LINCOLN
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TIME BELT RAILWAY OF CHICAGO
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CLEARING
Westbound
ILLINOIS CENTRAL
MARKHAM
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INDIANA HARBOR BELT
GIBSON
Northbound
INDIANA HARBOR BELT
GIBSON
Southbound
These Yards are Profiting with Car Retarders!
Can Yours?

IN twenty-six of the busiest freight yards across this country "Union" Car Retarders are speeding car classification—saving time and money for the railroads. Every one of these installations has shown marked reductions in classification costs—averaging from 10 to 55 cents per car. Each installation has paid, or is paying, its way quickly—annual return on investment ranging up to 69 per cent! In some cases, they have averted construction of additional track facilities.

Among the case histories of these twenty-six installations of "Union" Car Retarders, there is surely one which closely parallels your railroad's present economic or competitive freight classification problem. Equal or greater savings may be yours! Write for Bulletin 155—Better yet, let our representatives help you determinine the possibilities!

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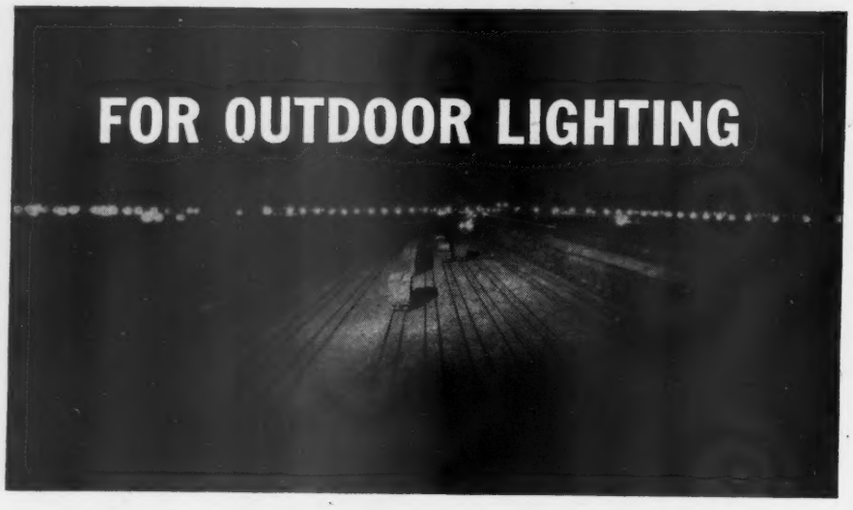

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News Department

(*Continued from page 634*)

Tour for Katy Representatives

The second of two system-wide tours to be taken by 70 "off-line" freight and passenger representatives of the Missouri-Kansas-Texas will begin on March 24, J. F. Hennessey, Jr., vice-president — traffic, announced last week. The trips, arranged so that M-K-T representatives can become familiar with the road and its territory will include tours of industrial, business and railroad facilities.

A. A. R. Booklet Tells Meaning of "Working on the Railroad"

"The Human Side of Railroading," a publication in the Association of American Railroads' information series, formerly circulated in mimeographed form, is now available in printed form. The pamphlet is full of information about railroading and tells what is appealing about each job.

B. & O. Resumes Meal Service in Coaches

"Serva-Seat" service, instituted by the Baltimore & Ohio before the war, but discontinued durng that period, was reinaugurated this week on two of that road's trains, the "National Limited" and the "Diplomat," according to President Roy B. White. This feature provides for serving inexpensive table. d'hote meals at the seats of those coach passengers who prefer this service to going into the dining car. Waiters distribute "Serva-Seat" menus to these passengers, take their orders and as these are filled from the dining room serve them on compact aluminum tables. "Serva-Seat" meals are featured at 65 cents for breakfast, 75 for lunch and 85 for dinner.

Reopens Frisco Truck Case

The Interstate Commerce Commission has reopened for further hearing a case wherein its prior report denied a Frisco Transportation Company application for authority to purchase operating rights of an independent trucker because the St. Louis-San Francisco subsidiary had stated that it would not consummate the transaction if its trucking operations on the acquired routes were restricted to make them auxiliary to train services of its parent railroad. The proceeding, docketed as No. MC-F-2413, involves Frisco's application for authority to acquire rights from the Righter Trucking Company of Charleston, Mo.

The further hearing will be held April 9 at the Mark Twain Hotel, St. Louis, Mo., before Examiner Melvin L. Winson. It was granted by the commission, upon petition of the Frisco, for the purpose of receiving evidence "as to whether the proposed transaction would be consistend with the public interest . . . in the event approval is made subject to conditions, including appropriate key-point conditions, limiting the service . . . solely to that which is auxiliary to, or supplemental of, the train service of the railway."

As noted in the *Railway Age* of August 10, 1946, page 239, the prior report found that the transaction could not be approved on an unrestricted basis, and that Frisco had made no effort to justify it on any other basis. Meanwhile dissenting commissioners protested that the acquisition should have been approved, subject to such conditions as were found warranted, thus leaving to the applicant "the final determination as to whether or not consummation of the purchase is made undesirable by such restrictions."

I. C. 4-H Club Train to Tour

An Illinois Central 4-H Club "rolling school" train, containing exhibits which illustrate the most advanced methods in farming, stock-feeding and forestry, will begin a tour of the road's Louisiana lines on April 1. The exhibition cars have been outfitted with display counters, signs and stalls for livestock and equipment at the I. C.'s Chicago shops. A portion of the train's equipment will consist of two seatless coaches and a baggage car for exhibits and a coach for motion pictures.

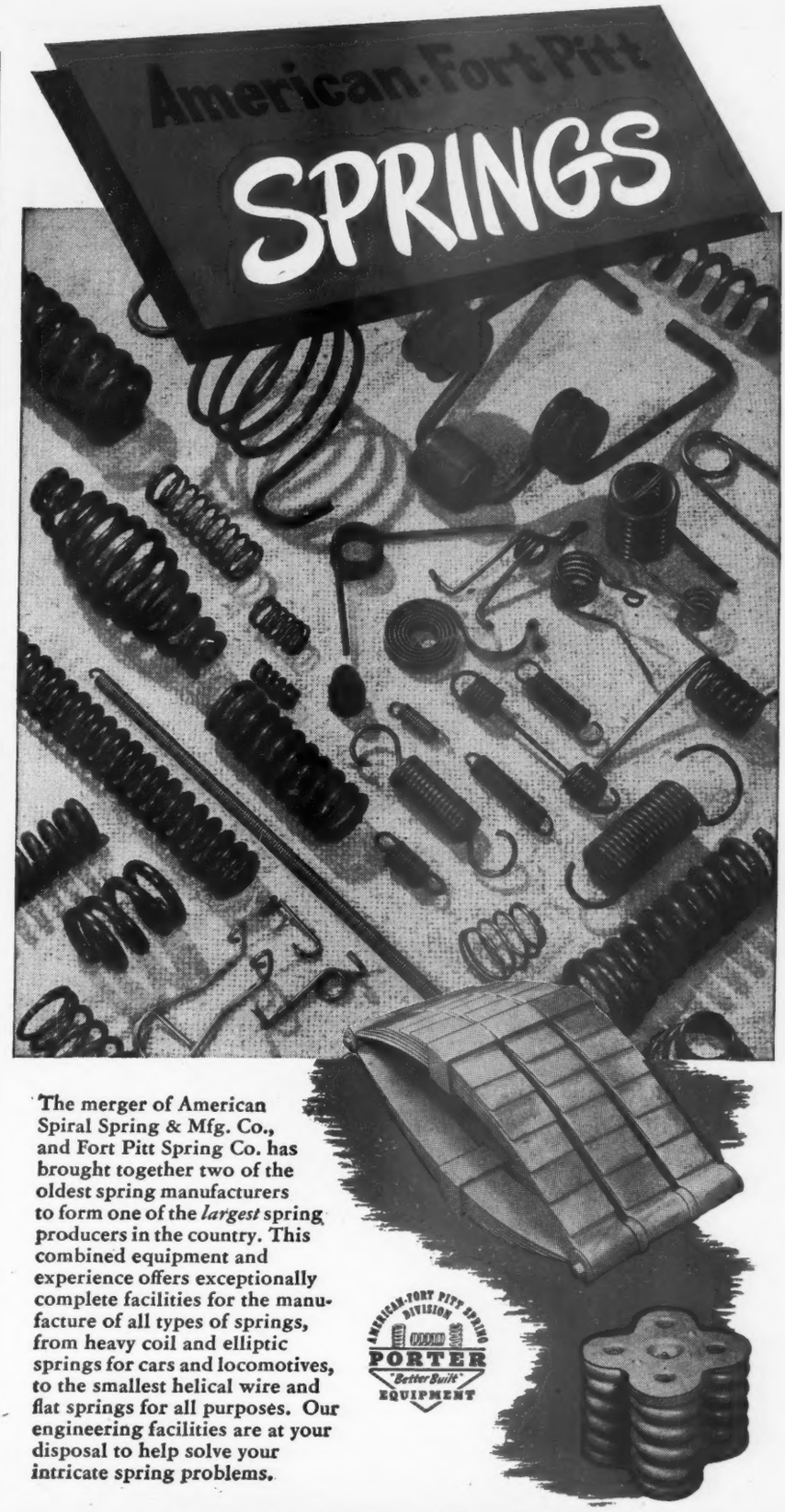
Hearings on Bus Fares

Hearings in connection with the Interstate Commerce Commission's general investigation of bus fares will begin on June 9 at the commission's Washington, D. C., office before Commissioner Lee, Examiner Corcoran and cooperating state commissioners. The proceeding, docketed as No. MC-C-550, was instituted by the commission last July and prehearing conferences were held last October and in January.

The initial Washington hearings will be followed by others on June 16 at the New Post Office Building, Boston, Mass.; August 4 at the Post Office Building, San Francisco, Calif.; September 15 at the Sherman Hotel, Chicago; and November 17 at Washington. The order of assignment also provides for additional Washington sessions at a time to be fixed—"solely with respect to the fares and charges for, and the rules, regulations, and practices governing or affecting, the transportation by respondents in interstate commerce over irregular routes and in special operations over regular routes."

It is further stipulated that the proceeding will be assigned for hearing at New York, Washington, Philadelphia, Pa., and Wheeling, W. Va., at times to be fixed "solely with respect to . . . transportation . . . of pasengers over routes over the entire distance of which frequent schedules are operated from and to New York, from and to Washington, from and to Philadelphia, or from and to Wheeling, and on which the carrier collects cash fares by the use of coin boxes, cash registers and receipts, tokens or commutation tickets and books, and over which routes at least 50 per cent of the passengers paid such cash fares for the year 1946."

Evidence relating to services of the latter type or to irregular-route and special-service operations may be presented at these specially-assigned hearings or at the general sessions, at the election of respondent carriers.



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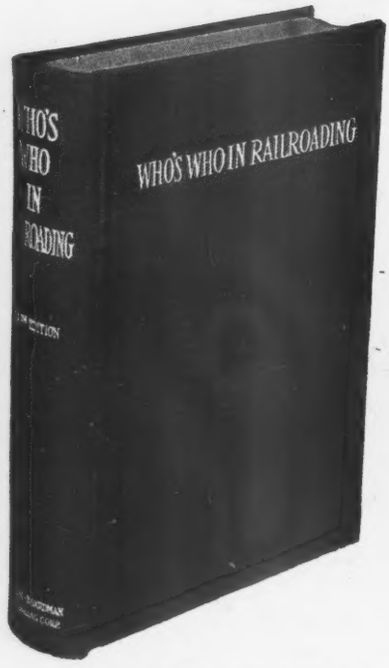

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